



GOOD FORE. LEGS

VETERINARY NOTES

FOR

HORSE OWNERS:

AN EVERY-DAY HORSE BOOK.

ILLUSTRATED

BY

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VETERINARY NOTES FOR HORSE OWNERS.

CHAPTER I.

Sprains.

SPRAINS IN GENERAL—SPRAINS OF THE SUSPENSORY LIGAMENT AND BACK TENDONS—CURB—SPRUNG HOCK—SPRAIN OF THE FETLOCK JOINT—SHOULDER SPRAIN—SHOULDER SLIP—SPRAINS OF THE ELBOW, HIP, AND STIFLE—SPRAINED BACK.

RESPECTING sprains of tendons and ligaments, Professor Williams, in his work on Veterinary Surgery, remarks :—"Professor Dick was of opinion that there was always rupture of the fibres in a sprained tendon or ligament. But I think that the condition which we term strain may arise from repeated extension or slight stretching, without the fibres being at first ruptured at all ; and that an altered nutrition is so produced, which leads on to inflammation of the part, and finally to the softening of some portion of the fibres, by which they lose their toughness, and become broken across." The result of this altered nutrition is that the part gets into a gelatinous condition.

The very obvious lesson which horse owners should learn from this is, that they ought never to neglect a

case of sprain, however slight it may be, but should give the animal rest, should endeavour to reduce the inflammation as quickly as possible, and should on no account put him to work again until the part has regained the whole of its former health and tonicity ; or until it has recovered as far as the nature of the injury will allow it to do.

My own experience is that sprains of the back tendons and suspensory ligaments—which are by far the most common accidents to which horses employed in fast work are liable—come on, as a rule, gradually. The history of the case is usually somewhat as follows. During previous work on different occasions there was some heat and tenderness found in the affected part, which symptoms more or less subsided on the application of hot or cold water ; so that the horse was enabled, by the aid of a high-heeled shoe, bandages, “ cloths,” &c., to continue exercise until the day on which the final accident occurred. Here we may easily see that owing to inflammation, however slight, continuing for a considerable time in the part, its nutrition was interfered with, and its structure was consequently rendered weak. I have invariably found that, when a sprain of these tissues occurs without warning, it has been caused by some unforeseen accident, as a sudden wrench from stepping in the gallop on an inequality of the ground, &c.

Repair of injury is exceedingly slow in tendons and ligaments, on account of their being but slightly supplied with blood-vessels ; hence the necessity of a long rest in such cases. By this I mean from three months for a slight sprain, to six or seven for a severe one.

When a tendon, ligament, or muscle is sprained, inflammation ensues with consequent congestion of blood in the vessels of the part, which become gorged and distended, while lymph—the colourless and fluid portion of the blood—exudes through their walls. This exudation is partly external to the sprained structure, causing outward swelling, and partly within it, causing separation of the fibres and consequent shortening. Hence we often see a bowed condition of the tendons of the legs in old cases of sprain. Now if the inflammation be quickly subdued, the exudation will be absorbed, and the part will recover its natural health and soundness. As the function of an inflamed part is arrested, its absorbents will be unable to take up the exudation as long as inflammation be present. This lymph, being possessed of vital properties, can remain in the tissues unchanged but for a very few days; in fact, it soon becomes coagulated and organized. If the process of repair sets in after all inflammation has ceased, and before this organization has proceeded beyond its early stages, degeneration of the new structure may take place, and it may become absorbed. But if the process of organization be allowed to proceed further, the exudation will become converted into a new form of fibrous tissue, which in time will become supplied with blood vessels, and there will be a permanent thickening of the part—a condition but slightly amenable to any reparative process, while the tendon or ligament so affected will be most materially weakened.

The thickening left after a sprain is an undoubted sign of weakness, both on account of the “altered nutrition” set up in the part, and on account of the fibres

at the seat of the injury having become more or less separated one from another by the exudation within, while the external exudation will have distended the sheath, thus preventing it from binding down and supporting the structure. Dealers and others wanting to sell a horse with a thickened tendon, often try to make out that the leg is as sound as when the horse was foaled, because, as they say, it has got "callous," an expression which the buyer should understand to mean "incurably weak." For here we have the stage long gone by in which repair was possible; and the more work such a horse gets, the weaker and weaker will the affected tendon most assuredly become.

General Treatment for Sprains.—From the preceding remarks we may learn that in these injuries our efforts should be directed to subdue, without loss of time, the inflammation before any organic change takes place; our means being, cessation from all work, putting the part at rest by, for instance, a high-heeled shoe, or by slings; physic, leeches, hot fomentations, and cooling diet. Physic acts by determining the blood to the intestines away from the inflamed part; it also diminishes congestion by lessening the actual volume of the blood, in that it takes away a portion of its watery constituents, and it purifies the blood by removing effete matter, while it prevents the bad effects which might accrue from the absorption of deleterious gases given off by the *injeta* in the intestines.

One or two enemas may be administered in order to clear out the bowels before the physic acts.

Three quarters of an ounce of nitre may be given in the water or food daily for a week. The nitre acts as

a diuretic in purifying the blood, and also appears to aid in keeping the blood fluid—an important condition in lessening congestion.

Leeches act locally in relieving the congested and distended blood-vessels. Warm fomentations soothe the pain by causing swelling, which relieves the nerve fibres in the inflamed structure of pressure; it also appears to lessen the inflammation, which it may do by increasing the action of the skin. When the pain is great, a decoction of poppy heads or of opium may with advantage be substituted for plain water. During the intervals between the fomentations, if practicable, a bandage previously soaked in warm water may be kept applied to the part, and covered over with oil-silk or flannel. This will act almost as well as a continued fomentation. Spongio-piline is good for a flat surface, but cannot be so closely applied to the legs as a cotton bandage and oil-silk; or during these intervals, if the pain be great, the following anodyne application may be smeared over the part:—

Extract of Belladonna	-	-	2 parts.
Camphor	-	-	1 part.

Gum sufficient to make it adhere.

Long narrow leather buckets with wooden bottoms, reaching up to a horse's knees, are most useful for fomenting the legs, and should be kept at hand in every large stable.

For constitutional treatment, if the pain be very excessive, we may give 2 oz. of tincture of opium, but if there be more fever than pain, which will be shown by the pulse being quick, hard and full, give one or two doses of—

Fleming's Tincture of Aconite - 6 to 7 drops.

Water - - - - - 1 pint.

With an interval of three hours.

While the inflammation lasts, keep the horse on laxative diet, such as bran mash, grass, carrots, &c.

As horses that are very lame behind will seldom lie down, they should be put into slings.

When the inflammatory stage has passed, which may be known by the disappearance of all heat and pain, cold water should be applied in order to restore the vessels of the part to their former tonicity, so that they may be able to absorb the exudation thrown out, which exudation is the cause of the swelling and thickening. Cold water is best applied by a jet from a hose; this braces and invigorates the vessels and nerves of the part by the cold and shock, as well as promoting absorption by pressure. In India a jet from a *mussuck* (a skin used for holding water) may be substituted. The water may be cooled by allowing the *mussuck* to remain for some time exposed to the wind in the shade. Water may be used in this way four or five times a day for about twenty minutes at a time. Standing the horse in a running stream for similar periods is good practice. If he is kept for a longer time in cold water, the circulation in his legs is apt to become impeded.

I do not like cold wet bandages, unless, indeed, the owner of the horse looks after them himself; for they dry quickly, and servants cannot as a rule be depended upon to keep them constantly wet and loose. If they be used, they should consist of only a single fold of thin cotton, so that evaporation may be encouraged as much as possible;

for the effect of the cold arising from this evaporation is the sole benefit accruing from their employment. Instead of cold water, the following capital refrigerent given by Stonehenge may be used :—

Sal ammoniac	-	-	-	2 ounces.
Vinegar	-	-	-	$\frac{1}{4}$ pint.
Methylated spirits of wine	-	-	-	$\frac{1}{4}$ „
Water	-	-	-	2 quarts.

Mix.

After the vessels have been restored to healthy action, I would strongly advise that, when practicable, pressure, with the view of causing absorption, should be applied for a considerable time in preference to blisters, or the firing iron, whose use is to determine an increased supply of blood to the part in order to hasten the process of repair. That pressure causes absorption—not only of fluids, but even of bone—is a fact concerning which I can offer no satisfactory explanation. An instance of this absorption of bone is afforded to us when a horn tumour is produced by undue pressure of the toe clip of the shoe, for opposite to this tumour there will always be found a groove scooped out of the toe of the pedal-bone. Now my reason for preferring, in this stage, pressure to irritants is that the latter set up inflammation in the part, which causes renewed congestion of the vessels, that have but lately recovered from its injurious effects, and may thus become so far weakened as never to regain their former tonicity, while the application of pressure is free from this objection ; on the contrary, while it is being employed, the vessels will gradually recover their normal vigour. A permanently thickened leg is not unfrequently the

result of blistering or firing, the reason for this being that in these cases the inflammation caused by the application produced such a degree of congestion* in the vessels that they became permanently weakened, from being over-distended and strained, and were therefore unable to absorb the exudation they threw out; which exudation became in process of time converted into fibrous tissue. From this we may readily see the danger of blistering or firing while congestion of the vessels still exists. The benefit derived from hand-rubbing is due to the pressure employed in its performance.

After the effect of pressure has been tried for some time the part might be stimulated with—

Biniiodide of Mercury	-	-	-	1 part
Lard	-	-	-	30 parts,

every second day or so, the object of this being to bring a continued supply of blood for the repair of the part, without causing actual congestion in it. It strikes me most forcibly that if we apply an irritant capable of producing congestion of the vessels, we shall not alone weaken them, but also cause their function to be arrested as long as such a condition continues.

For parts to which pressure cannot be applied, I would advise a longer rest, and then gentle stimulation with the biniiodide of mercury ointment.

For sprained structures which are deeply seated, such as curbs, &c., the application must be much stronger than would be advisable for more superficial injuries.

The chief thing in the curative treatment of sprains is *rest*, which should be as perfect as can possibly be obtained, and not for a few days only, but for months.

It is notorious how unsuccessful practitioners are in the treatment of even slight sprains of the back tendons or suspensory ligaments; while a man may rupture most important structures, as in various dislocations, and yet with a long rest—and without being fired or blistered—may make a perfect recovery; the difference simply being one of rest. Of course it is impossible to keep a horse so completely in repose as one can a human patient; still this is no excuse for working a horse too soon. A great deal of injury is done by the idea that exercise causes absorption, when the legs are still inflamed, or the vessels weak after a sprain. That it causes absorption for the time being is quite true, but the legs fill worse than ever two or three hours afterwards.

Sprains of the Suspensory Ligament and Back Tendons.

'For convenience' sake we will consider these accidents under one heading, after glancing at the position and functions of the above structures.

Anatomy of the Suspensory Ligaments.—The suspensory ligament (*e*) is a strong inelastic ligament at the back of and close to the cannon-bone. It originates at the head of this bone, and at the lower row of the small bones of the knee; and runs down the groove formed by the two splint-bones, for about two-thirds of the length of the cannon-bone, then divides into two branches, which become fixed into the summits of the sesamoid bones, that lie at the back of the fetlock joint; and extend downwards and forwards, again uniting in front of, and at about the middle of

Fig. 1.

DIAGRAM OF FOR-LEG IN PARTIAL SECTION, WITH
SOME OF THE STRUCTURES REMOVED.



- a. Perforatus tendon.
- b. Perforans tendon.
- c. Check ligament.
- d. Point of union of b and c.
- e. Suspensory ligament.
- f. Point at which e becomes generally sprained.
- g. Point of attachment of e with the sesamoid bones.
- h. Sheath of a.
- i. Inferior sesamoid ligaments.
- j. Perforans tendon.
- k. Insertion of a.
- l. Navicular bone.

- m. Sensitive frog
- n. Horny frog.
- o. Point of pedal-bone.
- p. Pedal-bone.
- q. Sensitive laminae
- r. Pyramidal process of p.
- s. Coronary, or short pastern-bone.
- t. Insertion of e.
- u. Os suffraginis, or long pastern-bone.
- v. Sesamoid-bones.
- w. Cannon-bone.
- x. Extensor suffraginis.
- y. " pedis.

the pastern, becoming strongly attached to the tendon of the muscle which extends the foot ; it again divides and is finally inserted to the sides of the coronary bone.

Acting by the mechanical advantage afforded by the sesamoid bones, the suspensory ligament serves as a powerful brace for preventing undue extension of the fetlock joint.

Anatomy of the Back Tendons.—The back tendons are composed of two, which originate from muscles that serve to flex the foot. From the knee they run down behind the suspensory ligament, one overlying the other. The posterior tendon (*a*) (the perforatus) forms a sheath for the passage of the other (*b*) (the perforans) at the back of the fetlock joint, and becomes attached to the sides of the coronary bone (*s*).

The perforans tendon halfway down the cannon-bone (*w*) is joined by a powerful ligament (*c*) which originates at the head of that bone, and at the lower row of the small-bones of the knee, having, in fact, almost the same origin as the suspensory ligament. This so-called *check* ligament forms with the lower part of the perforans tendon a strong brace for preventing undue obliquity of the pastern. In fact, its office is very similar, but less in degree, to that of the suspensory ligament. The perforans tendon, after affording attachment (at *d*) to this check ligament, passes over the sesamoids (*v*) which act as a pulley for it, then down the back of the pastern-bones, over the third sesamoid or navicular bone (*l*) (another pulley), and is finally inserted into the base of the pedal-bone (*p*).

On taking a side view of a well-formed horse's leg, we should see the suspensory ligament rising close

above the fetlock joint between the cannon-bone and back tendons, and extending nearly two-thirds of the way up to the knee; the skin should be firmly bound down to it, and it should stand clear and well defined from bone and tendon, as if it were cast in a mould. When there is a difficulty in marking the course of the ligament with the eye, be assured that the leg is not of the kind to stand work.

As tendons and ligaments are naturally almost always sprained at their weakest points, we find that when the suspensory ligament "goes," it usually does so at one or at both of its branches just above the fetlock joint.

The only parts at which, from mechanical considerations, it appears that the perforans tendon can be sprained are its attachment to the pedal-bone, and the point where it passes over the sesamoid bones. On carefully examining the perforatus—the rearmost one of the two back tendons—one may reasonably conclude that it can very rarely indeed become sprained.

Thus we have from undue extension of the foot, as in galloping, or in draught when going downhill with a heavy weight behind, injury of the suspensory and check ligaments, and of the back tendons (perforans). While in excessive labour in flexing the foot—as in galloping through heavy "holding" ground, especially with a heavy weight up, or in drawing heavy loads—we have sprain of the perforans tendon from the violent strain thrown on it by the contraction of its muscle.

Cart-horses are most liable to sprain the check, while those doing fast work usually injure the suspensory ligament. This difference between the cart-horse and

the galloper has, I believe, up to the present received no satisfactory explanation; it is therefore with some diffidence that I offer to the reader my own views on the matter.

Manner in which the Suspensory Ligament gets sprained in Galloping.—In the gallop the heel of the fore-foot comes first to the ground. Now when the horse is fresh and untired, the muscles to which the perforans and perforatus tendons are attached contract with such precision that the foot is “picked up” (flexed) before undue strain can fall on the suspensory ligament; in fact, these tendons act as assistant braces to it. But if the pace be continued the horse will “dwell” more and more in his stride, and as the two muscles which move the tendons become gradually fatigued, they also become unable to contract with sufficient quickness to save the suspensory ligament from undue strain; besides this, the muscles get tired, while the ligament does not experience the sensation of fatigue; hence the horse throws weight on the latter to save the former. We may easily imagine how great this strain must be in the case of a race-horse struggling home during a desperate finish. When the muscles which flex the fore-legs become tired, almost the whole weight of the horse and his rider, which is propelled forward by the hind, has to be borne by the suspensory ligaments of the fore legs. No wonder then that race-horses, as a rule, break down within the “distance,” especially if the ligament has been previously injured. We also may readily see why they are more apt to break down when out of work than when in condition.

A striking proof that as long as horses are not

fatigued they are not apt to sprain their suspensory ligaments, is afforded by the fact that animals, which have been rendered totally unfit for the turf on account of this accident, often make most serviceable chargers for ordinary parades, on which a gallop is seldom required to be made beyond a few hundred yards.

We find in training race-horses with weak suspensory ligaments or back tendons, that the only safe method for giving them fast work is by short and repeated gallops. For instance, instead of sending such a horse a mile gallop, we might give him three spins of three furlongs each, with intervals of from a quarter to half an hour, in order to allow the muscles to recover their strength and tone.

I think we may take for granted the existence of more or less perfect harmony between the strength of the muscles of the fore and hind extremities, and that if a horse were turned loose and allowed to gallop, the muscles of the latter would get fatigued as soon, or nearly as soon as would those of the former. Here the diminished assistance afforded by the perforans and perforatus tendons to the suspensory ligaments, as their muscles became tired, would be compensated for by the decreased strain of the slower pace. But if we put a jockey up, this harmony is at once destroyed, for then, the weight being thrown forward by the position assumed in riding, the flexor muscles of the fore-legs will have far more work in proportion to do than the muscles of the hind, and will consequently become more quickly fatigued.

When a horse is galloped on hard ground, the sudden jar experienced is very apt to strain some of the fibres

of the ligament, and thus to bring on the condition alluded to in the extract given at the commencement of this chapter. Soft ground gives more time for the muscles attached to the perforans and perforatus tendons to contract, and thus to save the ligament; while on hard ground the whole strain falls on that part with extreme rapidity: hence the danger of inducing sprain of the suspensory ligaments by galloping on such soil.

Both from theoretical considerations and from practical observations, I think I may lay it down as a rule that the suspensory ligaments in saddle-horses do not get sprained except when the flexor muscles of the fore-legs become fatigued in the gallop, or when the animal is worked on hard ground. The exceptions will probably be included under cases where undue or unexpected extension of the foot takes place from the horse treading on some inequality, or from landing on a hard spot when leaping. The lessons to be drawn from these considerations are too obvious to need detail.

Oblique Pasterns.—The longer and more oblique the pasterns are, the less liability is there of the horse spraining his suspensory ligaments on hard ground, because this conformation enjoys a greater freedom from concussion than the more upright shape. Hence we find in India, where the “going” is very hard, that oblique pasterns are almost indispensable for horses which have to do fast work in that country. With oblique pasterns the suspensory ligament acts at a certain mechanical disadvantage, which is more or less compensated by the greater freedom from concussion. When the ground is soft and level the balance is

naturally in favour of the more upright form ; but when the ground is hard the case is reversed, except for going downhill, when the weight, being thrown forward, jars the ligament at every stride. This is well understood by racing men, who always entertain the greatest prejudice against a horse with upright pasterns, when called upon to race down a hill.

In training horses with weak suspensory ligaments or back tendons, the work, if possible, should only be given up an incline.

Obliquity of the pasterns is chiefly obtained by increased length of the pastern bones.

In horses that are used for fast work, sprain of the suspensory ligament is nearly always confined to the fore-legs.

Sprain of the Suspensory Ligament in Cart-horses.—This rather rare accident with these animals generally occurs in the hind legs, and is due to extreme extension of the foot, as when going downhill with a heavy weight behind. Cart-horses with oblique pasterns appear to be more liable to this injury than are those differently formed. Here we have the ill effects of a mechanical disadvantage.

Symptoms of Sprain of the Suspensory Ligament.—As before said, this accident occurs generally at one or both of the branches of the ligament a little above the fetlock joint. In simple sprain there is heat and swelling of the part. If the injury be but slight the horse will stand level and will walk fairly well, but the lameness of the trot will be disproportionately great to that of the walk ; if the case be severe there will be considerable lameness, and the toe only will be brought to the

ground. When there is rupture of the ligament the fetlock pad comes down and the toe turns up, owing to the fetlock losing its powerful inelastic brace. If one branch of the ligament only is severed the descent of the fetlock pad will be more partial. Rupture of the suspensory ligament is the accident which is termed "a break down."

Sprain of the Check Ligament.—This injury is usually confined to cart-horses. As I have pointed out before, this ligament, in connection with the portion of the perforans tendon beneath it, serves as an assistant brace to the suspensory ligament, which may become severed, and the fetlock pad may come to the ground without the check ligament being sprained at all. That the sprain must occur during extension of the foot is evident, because the moment the foot is flexed the check ligament is thrown into a state of rest. Again, it rarely happens in the gallop where there is extreme extension of the foot. Hence it strikes me that the usual manner in which it gets sprained is by a sudden snap or jerk at a time when the upper portion of the perforans tendon is relaxed, which causes the whole of the shock to be borne by this ligament alone.

In the case of a sound horse walking at ease, or going down-hill with a heavy load behind him, the heel first comes to the ground, then the toe, the heel is now raised, and finally the foot quits the ground; but when a horse is moving a weight which taxes his strength considerably, and particularly when drawing it up-hill, the toe first meets the ground, the flexor muscles are contracted, the tendons are in a state of tension, and the check ligament is at rest; but as the weight is over-

come, at each step, the flexor muscles are suddenly relaxed, and the heel is brought down to the ground with a quick jerk, which is communicated to the check ligament at a moment when it is unassisted in bearing the strain by the upper portion of the perforans tendon.

The more the horse's strength is taxed, the more will the heel be raised from the ground on the toe first touching it, and the greater the consequent jerk will the check ligament receive. The steeper the hill the horse faces, the greater space will the heel fall through before it reaches the ground, and naturally the greater will be the strain on the check ligament. If we raise the heel by calkins, or by thick-heeled shoes, we shall thereby shorten the distance through which the heel falls, and consequently diminish its liability to sprain. Practical experience teaches the advisability of this proceeding. Again, experience teaches that sprains of this ligament are more apt to occur going up-hill in draught than on level ground, while they hardly, if ever, happen going down-hill, a mode of progression in which the suspensory ligaments are particularly liable to suffer.

Sometimes this ligament is sprained by over-extension when galloping, though the suspensory ligament is by far the more liable to suffer in such cases.

Sprain of this check ligament constitutes what is commonly called sprain or clap of the back sinews.

Symptoms of Sprain of the Check Ligament.—As sprain of this ligament usually occurs at its junction with the perforans tendon, there will be more or less swelling at the upper half of the leg between the knee and fetlock. "Very often, during the earlier stages,

the ligament can be felt swollen, prominent, and bulging, the tendons themselves being quite normal" (Williams). "Frequently, in slight sprains, it is not until the day following that on which the accident happened that any swelling is discoverable" (Percival). There is more or less heat and lameness, and the horse rests his toe on the ground in order to throw the injured ligament into a state of rest.

After a bad sprain we often find a permanent thickening, somewhat in the form of a knot, on it, about three inches below the knee. The existence of such a thickening materially detracts from the value of the animal.

Sprain of the Back Tendons.—The perforans tendon is generally sprained at the point where it passes over the sesamoid bones. If the injury be severe the inflammation will generally extend to the perforatus. There is usually a great deal of swelling above the fetlock joint, accompanied by heat, pain, and lameness. In the early stages the seat of the sprain may be detected by tracing the tendons with the fingers.

According to Professor Dick, rupture of some of the fibres of the perforans tendon at its attachment to the pedal-bone is a frequent cause of navicular disease. It is now generally considered to be a result, and not a cause of this complaint.

The apparent sprain of the back tendons which seems to occur about midway between the knee and the fetlock joint, and is usually followed by more or less of a "bow," is most probably the result of a blow inflicted by the hind foot, and not a sprain at all; as it is almost impossible from its structure that the perforatus tendon

should be sprained at that point. Here the use of leeches is plainly indicated.

General Treatment for Sprain of the Suspensory Ligaments, Check Ligaments, and Back Tendons.—In treating these accidents the inexperienced horse owner need not concern himself much, if he is unable to determine the actual seat of the injury; indeed, it will be sufficient for all practical purposes if he can find out that one or other of these structures be involved, as the general treatment applicable to any one when in a sprained condition is equally suitable for any of the others in a like state.

If the horse stands level, take off all four shoes; but if he does not, then apply a high-heeled shoe, or put him into slings if the urgency of the case demands it. Treat as directed under "general treatment for sprains."

In "a break down," *i. e.*, rupture of the suspensory ligament, apply "firm pledgets of tow placed in the hollow of the heel, to support the fetlock, maintained in their position by firm bandaging. The tow should be made into a firm roll, the fetlock pad elevated by an assistant, the roll of tow placed under it so as to completely fill up the hollow of the heel, and fixed in that position by a bandage. Other bandages should be placed round the leg as high as possible, to keep the parts together, and thus diminish the breach to be healed" (Williams).

After this accident a horse can never become fit for fast work again, but may do for slow. There always remains a swelling just above the fetlock, which gives the joint a peculiarly rounded look.

When the inflammatory stage has passed, apply cold water, as before directed, for three weeks or a month as the case may require, keeping the animal in the meantime on laxative food and *at rest*. If there still remain any thickening, put on a charge: we may use that recommended by Stonehenge, namely—

Canada balsam	-	-	-	-	2 ounces,
Powdered arnica leaves	-	-	-	-	$\frac{1}{2}$ ounce.

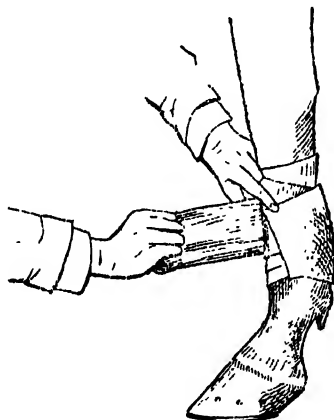
“The balsam to be melted and worked up with the leaves, adding spirits of turpentine if necessary. When thoroughly mixed, to be rubbed into the whole leg in a thin layer, and to be covered over with”—

Burgundy pitch	-	-	-	-	4 ounces,
Barbadoes tar	-	-	-	-	6 „
Beeswax	-	-	-	-	2 „
Red lead	-	-	-	-	4 „

This should be spread over a piece of washleather cut to fit the leg. This plaster should now be applied round the leg, and the edges brought close and tightly sewed together. Rolls made of tow, cotton, india-rubber, or other suitable material, should now be placed on either side, and a bandage should be put on over all. The best bandage is an elastic one about six feet long, and made of the same sort of elastic which is used for spring-side boots. This charge will afford a firm support to the weakened part, and will tend to cause absorption and consequent “fining down” by means of pressure. I believe the arnica acts in stimulating the capillaries of the skin. Before applying the charge the hair should be clipped off if it is long. The application may be kept on for about a month.

I am well aware that in recommending such an old-fashioned remedy as a charge, I run the risk of incurring the opprobrium of many holding advanced ideas on veterinary treatment; however, I have too frequently seen the good results obtained from its application to discard its use for sentimental reasons.

Fig. 2.



If, after the charge comes off, there still remains some thickening, rub in a little

Biniiodide of mercury	-	-	1 drachm,
Lard	-	-	4 ounces,

every second day or so for a month, regulating the stimulating effect, so that the skin may be kept rough and only slightly scabby. By this means there will be a continued and not excessive supply of blood brought to the part for the purposes of repair. This method, in such cases, I have found much superior to more violent means.

If the use of a charge be objected to, the cold applications may be continued for, say, a month longer than I have directed; while, during the intervals, pressure should be applied by means of carefully adjusted bandages. Afterwards the part may be stimulated by the weak biniodide of mercury ointment.

After all, the principal thing is a *long and complete rest*.

Bandaging for fast work.—After a sprain, a bandage should be used to afford support for the affected structures. If the animal is required for fast work, as in the case of a race-horse, some nicety of arrangement is requisite in order to prevent the loose end of the bandage working free. This accident is very apt to occur, especially with an elastic bandage, when the animal is galloping, if it is put on in the ordinary manner. When the bandage thus becomes unrolled, and remains attached to the leg only by the tape, it is very apt to trip the horse up. To obviate the chance of such an accident the following excellent method for securing any kind of bandage might be employed (see Fig. 2). Commence by laying the loose end diagonally across the fetlock with its extremity a little below that joint; then take about four turns round the leg so that the bandage may come close below the knee, take another turn in a downward direction, bring the loose end up and lay it flat against the bandaged part, and continue the turns over it. The loose end will now be firmly secured between the cloth on both sides. When put on according to this plan, the bandage cannot become undone unless the tape breaks.

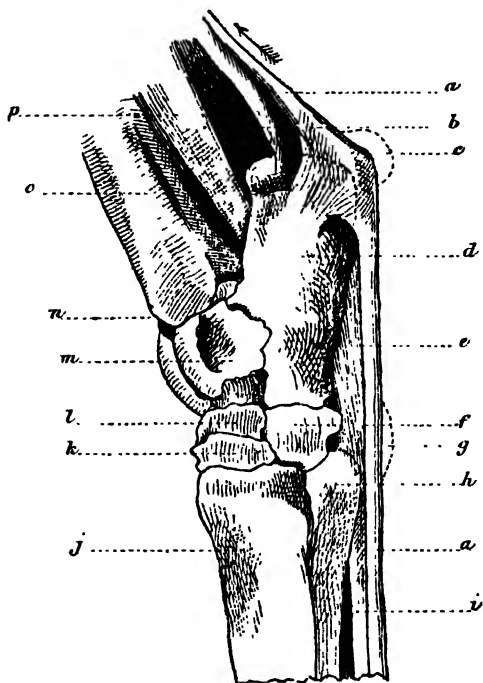
Curb.

If we regard the bones of the hock (vide Fig. 3), we shall see that the true joint is formed by the tibia (*o*) and astragalus (*m*), which latter bone rests on the cuneiform magnum (*l*), while behind it is attached the os calcis (*d*), which is supported on the cuboid bone (*f*). The office of the os calcis is to serve as a pulley for the perforatus tendon (*a*), which is firmly connected to the head of this bone, and as a lever for the tendon of the chief extensor muscle of the hock joint. I have marked the direction in which this tendon acts by an arrow-head. In order to keep the os calcis in its place, there is a very powerful ligament (*e*) (the calcaneo cuboid) attached to its posterior aspect, and finally inserted to the back of the cuboid bone and to the head of the external splint-bone (*h*). The action of this ligament is directly opposed to that of the two before-named muscles when the latter are used in galloping, leaping, &c. Professor Spooner appears to have been the first to draw attention to the fact that sprain of this ligament is the cause of curb. I have seen the nature of this injury clearly demonstrated by actual dissections.

Owing to the inflammation resulting from this sprain, an effusion about the part takes place, which causes the perforatus tendon to bulge outwards; this swelling, which is of varying size, appears generally about five or six inches below the point of the os calcis, on the posterior part of the hock. To detect a curb properly, the observer should stand at right angles to the horse's hock, and should let his eye run down the back of the joint from the point of the os calcis to

Fig. 3.

DIAGRAM OF OUTSIDE ASPECT OF NEAR HOCK, WITH
SOME OF THE STRUCTURES REMOVED.



a. Perforatus tendon.
b. Seat of thoroughpin.
c. Seat of capped hock.
d. On calcis.
e. Calcaneo cuboid ligament.
f. Cuboid bone.
g. Seat of curb.
h. External splint bone.

i. Perforans tendon.
j. Cannon bone.
k. Cuneiform medium.
l. Cuneiform magnum.
m. Astragalus.
n. True hock joint.
o. Tibia.
p. Perforans muscle.

below the head of the external splint bone, and if he finds that this line is straight and without a bulge at any part, and that the horse is not lame, he may conclude that he is free from curb.

The perforatus tendon being hard and dense, the swelling often appears like a small bony lump.

The ordinary look of a curb is well described by Mr. Percival:—"The tumour, or prominence rather, rising imperceptibly out of the surface, at a distance of from three to four inches below the point of the hock, gradually increases to the extent of one and a half or two inches, and from its middle or most prominent part as gradually decreases, vanishing in the surface of the skin in the same manner in which it took its rise therefrom."

A horse is said to have curby hocks when the point of the os calcis is, by natural conformation, thrown more forward than it ought to be. As this shape is a mechanical disadvantage to the action of the calcaneo cuboid ligament, it should be viewed with suspicion.

A hock whose os calcis is long appears to be most liable to curb, owing to undue leverage.

Animals in whom faulty conformation has induced curb ought not to be used for stud purposes, as this shape is generally transmitted to the offspring. "Curb is apt to cause lameness in young horses, or, when of fresh origin, in horses of any age; curbs of long standing being merely the remains of former disease, very seldom cause lameness, and are very often considered by men of experience not to be an unsoundness. . . . An aged horse, when suffering from curb lameness, is generally sound again in a few weeks; but if the patient

be a young horse, whose bones are not fully consolidated, it takes a much longer time before the parts are restored; and if such a one be put to work before they are thoroughly repaired and strengthened, lameness will in all probability recur" (Williams).

Legally, curb is always an unsoundness.

"Horses liable to curb should be shod with a shoe high in the heel" (Williams).

Men wishing to sell a horse that has curb, sometimes try to make out that the swelling is simply the result of a blow. If it occurred in the latter manner, the swelling would be superficial, and not deep-seated. Horses sometimes knock their hocks near the seat of curb when jumping stone walls.

The rounded appearance of a curb will guide us in not confounding it with any abnormally developed points of bone, such as the bend of the external splint bone.

In severe curb lameness, the horse, to avoid throwing pressure on the inflamed calcaneo cuboid ligament, keeps the limb raised and the perforatus tendon relaxed.

Treatment.—Put on a high-heeled shoe, give complete rest, administer a dose of physic, and apply continued fomentations of warm water to the part.

After the inflammation has subsided blister with—

Biniiodide of mercury	-	-	-	1 part,
Lard	-	-	-	8 parts.

In hot climates the amount of lard should be doubled.

This blister may be repeated once or twice, with intervals of at least a fortnight.

In obstinate cases fire in horizontal lines, so as to blemish as slightly as possible.

A long rest is the only certain cure. (See "General Treatment of Sprains.")

Sprung Hock.

Between the bones of the hock there are powerful ligaments (inter-osseous), which serve to bind them together. By a very violent strain, these ligaments may be sprained, as well as the annular ligament which passes round the hock, and also the back tendon (the perforans) which passes through the tarsal groove (vide Fig. 8). Such an accident is called sprung hock, and is a most serious one. There is extreme lameness and great swelling both above and below the inner and back aspect of the hock. "The tendon is bound down at the tarsal groove by the posterior annular ligament, thus preventing the swelling from appearing except above and below" (Williams).

I have seen two or three cases of slight sprain of the ligaments of the hock, which were characterized by heat at the front part of the joint with lameness. These cases were caused by the horse's foot getting caught in a fence when jumping.

In sprung hock there is high fever and very great pain.

Treatment.—Put the animal into slings, for the injury being in a hind leg he will not lie down. Give physic. Remove the shoe in order to relieve the limb of its weight. Use warm fomentations of poppy-heads or

opium, and treat as directed under "General Treatment of Sprains."

After this accident the animal should have about eight or nine months' rest, and if he gets this he will probably make a good recovery.

Sprain of the Fetlock Joint.

About this complex joint we have various parts that are liable to injury; such as the lateral and capsular ligaments; the inferior ligaments of the sesamoid bones (see Fig. 1); the suspensory ligaments, and the part of the flexor tendon which plays over the sesamoid bones. Injury to these parts causes inflammation of the different synovial bursæ, so that as a result of sprain we get a puffed and rounded appearance of the fetlock joint. The non-professional observer will find that "it is extremely difficult, if not impossible, to define what parts, in a joint made up of so many as the fetlock is, are most or especially diseased, and in what disease in its several stages precisely consists" (Percival).

Sesamoiditis, which is inflammation of the synovial bursa that lies between the sesamoid bones and the perforans tendon (see Fig. 1), is well described in Professor Williams' Surgery. It is a sort of hard thoroughpin at the back of the fetlock. Though the swelling will go from one side to the other on pressure, it is hard, because the part admits of little room for distension. This is a most intractable disorder. Professor Williams points out that wind-galls are soft, and that "this difference in the character of the two enlarge-

ments must be remembered, as wind-galls are often found involving this bursa."

"Knuckling over," as a result of hard work, appears to be due to relaxation of the capsular and lateral ligaments.

Symptoms.—Local pain, heat, and swelling; the toe only rests on the ground.

Treatment.—Apply a high-heeled shoe and act according to "General Treatment of Sprains." In bad cases apply a strong blister—

Binioidide of Mercury	-	-	-	1 part,
Iard	-	-	-	8 parts,

as the inflammation is deep seated.

When a fetlock is round and puffy without inflammation, much good may be derived from pressure applied by means of an elastic bandage. This pressure should be continued for at least a month.

Shoulder Sprain and Shoulder Slip.

The only ligament in this joint is the capsular, while, instead of binding ligaments, we have muscles, which play the part of ligaments in binding down the shoulder joint, and in preventing the outward bulging of the head of the humerus which articulates with the shoulder blade (the scapula).

When sprain of these muscles occurs, they lose their power of contracting, and hence the head of the humerus is seen to bulge out at each step. This condition is called "shoulder slip," and is generally found in young horses that have been employed in ploughing at

too early an age. The muscles of the shoulder quickly waste, as they are very vascular.

“This atrophy is different from that wasting of the shoulders seen in chronic foot lameness. In the one case (that of shoulder slip), the muscles of the external surface of the scapula only are wasted; whilst in the other all the muscles of the shoulder and arm are in that condition” (Williams).

The other forms of injury to this joint are more difficult to diagnose. “The gait of shoulder lameness is indicative of the seat of the disease. The patient does not carry his limb straight forward, but with a rotary motion, the limb being thrown outwards, and the toe made to form the segment of a circle” (Williams).

The animal will show pain when the limb is elevated from the ground; while its absence in the knee or elbow may readily be perceived by manipulating those joints. That the ailment which causes the lameness is not located in the foot or lower portion of the leg, may be concluded by there being neither heat nor pain present in those parts, and by the animal evincing no special tenderness on putting the foot to the ground.

Treatment.—The cure of these affections depends entirely on its being attempted early before organic change has taken place, the treatment being, rest with a high-heeled shoe on; fomentations, followed by mild and repeated blisters, in order to determine an increased and continued supply of blood to the part. (See “General Treatment of Sprains.”) After recovery, the nature of the work which induced the disease should be changed.

Sprains of the Elbow, Hip, and Stifle.

These are rare accidents, which may be diagnosed by the presence of lameness, with local heat, pain and swelling, while there is absence of the symptoms of disease in other parts. In elbow lameness "when the horse is made to move; he *drops* considerably, and seems in danger of falling at every step he takes, the limb itself almost bending double when any weight is thrown upon it" (Williams).

The round bone—the hip joint—is the favourite spot to which grooms ascribe disease when the horse goes lame behind, the fact being that it is hardly ever affected. On the contrary, the hock is the usual seat of lameness in the hind extremity.

Treatment.—The treatment is similar to that recommended for shoulder sprain.

Sprained Back.

The *psosæ* muscles, which are sprained in this accident, are those that constitute the under cut of a sirloin of beef or that of a saddle of mutton. Their office is to arch the back, and to flex the hip joint. They become sprained by a horse slipping up, by the hind legs getting caught in a fence when "crossing a country," or even by only jumping when the animal is young and unused to the work. There is more or less paralysis of the hind legs. If the horse is quite unable to support himself behind, even when lifted up on his feet, we may conclude that he has broken his back, an accident that is not incompatible with his possessing some

sensibility in his hind quarters, with the power of moving his tail ; always supposing that there has not been displacement of the fractured ends of the broken vertebra.

Treatment.—If the patient can stand moderately well, put him in slings ; but if not, then let him lie down, and keep a person near, so as to prevent him from attempting to rise. Give three or four enemas with intervals of a couple of hours, to clear out the intestinal canal, and possibly to soothe the inflamed parts. Instead of aloes, give a pint of linseed oil, and proceed as directed under “ General Treatment of Sprains.”

CHAPTER II.

SKIN DISEASES.

MANGE—POULTRY LOUSINESS—PARASITIC RINGWORM—PRURIGO—HUMID
TETTER—VESICULAR RINGWORM—SURFEIT—HIDEBOUND—CRACKED
HEELS—GREASE AND GRAPES—MUD FEVER—BURSATÉE—WARTS.

A MINUTE description of skin diseases is not within the scope of this work, nor indeed would it be of any practical benefit to non-professional readers. The subject is one that requires months, if not years of study, and even when mastered theoretically, the student will often find himself at fault in distinguishing between the various varieties, especially when they are of some standing. The broad general treatment is well indicated in most cases, and it will suffice for all practical purposes if we classify these diseases according to the treatment that is applicable to them, and not according to pathological considerations.

Hence we may classify mange and parasitic ringworm together, the former consisting of three varieties, the latter of two. We may look upon the poultry louse as an adventitious visitor, and not as a resident. Prurigo, humid tetter, and vesicular ringworm may come under one heading, while surfeit and hidebound may both be regarded separately. Mud fever and cracked heels seem to differ only as to their situation, while grease and grapes may be considered as but aggravated

forms of the latter. Bursatee and warts are each clearly distinguished from other skin diseases.

Mange.

Mange is a contagious disease caused by the presence of a small parasite, which is very like the insect that produces itch in the human subject. There are three varieties of the mange parasite of the horse described, which differ somewhat one from another in their respective modes of attack.

I am led to believe, from the experience of many careful observers, that true mange—namely that which results from the presence of an insect—is a very rare disease. The term, being a convenient designation, is often applied without discrimination to any skin eruption accompanied with itching, which may resemble the parasitic form in appearance. In true mange, if a few scabs be removed and placed in the sun on a sheet of white paper, the insects may after a short time be seen moving, by the aid of a magnifying glass, or even by the naked eye.

As explained in Professor Williams' Surgery, these creatures live on serum, which is the watery fluid that exudes on opening a blister. In order to obtain this food, these parasites irritate the skin by burrowing into or by biting it; vesicles, or minute blisters, are formed, and on bursting, the serum flows out and forms a scab. These scabs are generally first seen on the side of the neck, close to the mane, and then they gradually spread down the neck, along the back, down the sides, or towards the head and face; the tail also may be

attacked. There is great itching of the skin of the affected parts, from which the hair falls off, while the skin assumes a bare, scaly, and furrowed appearance. When suffering from the attack of one variety of the insect, this bare skin becomes dry; while when another—and the more common—kind is the aggressor, there is a continued watery discharge from the vesicles, which keeps the part moist.

Treatment.—The horse should be kept in a stall by himself; his clothing should be dipped into boiling water, and his harness, gear, &c., should be rubbed over with oil of turpentine, so as to destroy any of the insects that may have remained on them. The stable fittings, &c., should be washed with soap and hot water, and then lightly brushed over with crude carbolic acid.

As “the course of the disease is slow in horses well-fed and cared for, but in those under less favourable circumstances it spreads with great rapidity” (Williams), we should attend to the horse’s general health, so as to render his skin an unsuitable habitat for these parasites. A mild dose of physic—say a pint of linseed oil—may at first be advisable, while a linseed mash may, with advantage, be given every or every second night, as linseed has an excellent effect on the skin. A drachm and a half of tartar emetic may be divided in his food daily for a week or ten days, then, after a few days’ interval, give an ounce of liquor arsenicalis, daily, in the same manner. Both tartar emetic and arsenic have a marked beneficial effect on the skin.

As the destruction of the insect is the only radical

means for removing the disease, the affected parts should be well washed with warm water and soap, in order to remove the scaly cuticle under which these parasites conceal themselves; and after washing, one of the different mange applications should be rubbed in. I have found nothing more efficacious than plain kerosine oil, applied once a day, and allowed to dry on the horse, if possible, in the sun. Kerosine oil is frequently used in India for this purpose, and is also recommended by M. Trasbot, Professor at Alfort.

An excellent application for mange, and indeed for any skin eruption resembling it, especially when accompanied by itching, is—

Corrosive sublimate -	-	-	40 grains,
Prussic acid (Scheele's strength)			1 drachm,
Water -	-	-	$\frac{1}{2}$ pint.

*Prussic acid acts most beneficially in allaying irritation of the skin.

In cases of doubt as to the nature of the disease, I would advise that the above be tried.

If the affected parts be of limited extent, mercurial ointment is an excellent application. If applied extensively, it is apt to cause salivation.

A mixture of sulphur and train oil forms the common mange ointment.

As the eggs of the mange insect take several days to hatch—fourteen being the usual number stated—we should continue the applications for the removal of these parasites sufficiently long to ensure both their destruction and that of their eggs, which, during the

period of incubation, are hidden in small galleries underneath the skin.

Poultry Lousiness.

The small insects that infest ill-kept poultry are very apt to settle on the horse if these fowl be allowed free ingress into a stable, or if they be kept close to it. These parasites cause intolerable itching of the skin, but as they can live for only two or three days away from their natural habitat, removal of the poultry will constitute the only treatment required. On board ship, during long sea voyages, I have often been attacked by these insects from having sat down inadvertently on a hen-coop.

Parasitic Ringworm

Occurs under two forms, both being due to vegetable parasites, whose presence and distinguishing appearances may be detected under the microscope. Both are characterized by an eruption which appears on the skin in circular patches of, usually, about the size of a florin, but may be considerably larger. "This form of ringworm differs from the vesicular form (*herpes circinatus*) by the absence of vesicles, and by the formation of scurf or scales around single hairs, or in patches surrounding several hairs" (Williams). In both, the irritation may produce soreness and scabbing of the skin.

Any one, except perhaps a highly experienced observer, will find great difficulty in distinguishing between these two forms—unless by the aid of the microscope,

—or even in telling the difference between them and vesicular ringworm.

Ringworm is readily communicated to horses by men or other animals (cats, for instance) that may be affected, and *vice versa*. Many such instances are recorded.

Treatment.—Treat as for mange.

Prurigo

Is a term we may use to signify a scaly non-parasitic condition of the skin, which is accompanied by excessive itching. It somewhat resembles mange in appearance ; the difference being that in prurigo vesicles are not formed, and the skin has not the same scabby, furrowed look. It spreads more rapidly, is not caused by contagion, and there are no parasites present. It seems to be brought on by some influence which interferes with the healthy action of the skin, such as checked perspiration, want of grooming, a heated state of the system, &c.

The root of the tail is often the chief point of attack. The mange insect usually directs its attention to the mane, and to the parts of the neck and shoulders near it ; while the eruption of prurigo is much more general. Prurigo, attacking the root of the tail and the parts about it, is very common during the hot weather and rains in Bengal, and especially in Calcutta ; it being in this case due to climatic influences, combined with the use of food of too highly heating a nature, and too little exercise. The climate of Bengal being a very damp one, the presence of moisture in the heated air

prevents the free evaporation of perspiration from the skin; besides this, in the hot weather it is difficult to procure a sufficiency of green fodder. In the dry hot climate of the Punjaub, prurigo and humid tetter are rare.

Although prurigo is usually compared to an affection of the human skin in the tropics called "prickly heat," I have preferred to liken humid tetter to the latter, both being vesicular diseases, while prurigo is a scaly inflammation of the skin.

Constitutional Treatment.—Give bran mash and a dose of physic. Keep the horse on soft food and green, meat. But if he be already on grass, substitute hay for it.

"It must also be borne in mind that all rough articles of diet, such as meal seeds, coarse straw, and other inferior and damaged stuffs, are very prone to cause skin diseases" (Williams). Give a bran and linseed mash every night; but if this causes too much trouble, then, instead of the mash, mix a couple of ounces of linseed oil in the horse's food two or three times a day; and in his corn or mash give a drachm and a half of tartar emetic once a day for a week or ten days. The use of common or rock salt should not be neglected. This treatment will generally suffice for mild cases. In more obstinate attacks, stop, after a week's time, the tartar emetic, and substitute an ounce of liquor arsenicalis. With a few days' intermission these medicines may be alternated again in this manner. If the patient be suffering from indigestion he should be treated accordingly.

The horse should be warmly clothed, and should get

plenty of exercise, in order that his skin may act properly, so as to relieve the irritation. But between the woollen clothing and the skin a cotton sheet should be placed, to obviate the itching which the presence of the harsher substance would cause. While the ailment lasts, a soft rubber should be substituted for the brush and currycomb.

Local Treatment.—Dress the irritated surfaces with either—

Carbolic acid	-	-	-	-	1 part,
Glycerine or oil	-	-	-	-	40 parts;

or—

Goulard's extract	-	-	-	-	1 part,
Glycerine or oil	-	-	-	-	4 parts;

and wash the horse every second or third day with warm water and carbolic or tar soap, taking care to dry him well afterwards, and then apply the dressing. If the irritated parts be of small extent, a little mercurial ointment may be used instead of the other dressings. Mr. Gamgee recommends the use of benzoated oxide of zinc ointment, which is not to be washed off. If the irritation be great, apply—

Prussic acid (Scheele's strength)	1 drachm,
Water	- - - - - $\frac{1}{2}$ pint.

If the itching round the tail be due to the presence of worms in the rectum, the animal should be treated for them. (See under head of "Intestinal Worms.") When the tail is affected, a leather sheath should be adjusted on it, to prevent him from rubbing it.

As a dressing for prurigo and other skin affections, the natives in India use "duhee," a kind of sour buttermilk.

Humid Tetter.

Humid tetter is an eruption on the skin of the horse of a number of small vesicles, which so closely resembles in appearance the eruption of mange that it is often mistaken for it. Unlike mange, it generally comes on without warning and spreads rapidly, usually attacking the soft skin of the thighs, flanks, neck, or shoulders, while mange most frequently commences in the mane. It is non-contagious, there being no parasites present, and is due to some constitutional disturbance, generally aggravated by the heat of the weather. There is, after a short time, a discharge of fluid from the vesicles, which may serve to distinguish it from prurigo; in fact, it is a vesicular eruption, while prurigo is a scaly inflammation of the skin. It is very common in India during the hot weather, and especially so in those parts where the climate is damp; the natural cause of this being that the moisture in the air prevents the natural and healthy evaporation from the skin, which is thus unable to perform properly its excretory office,—irritation, as manifested by the eruption, being the natural consequence. In “prickly heat” in the human subject we have the almost exact counterpart of humid tetter of the horse. The irritating effect of a flannel shirt next the skin during the hot weather in the tropics makes itself quickly manifest to the wearer who may have a tendency to “prickly heat.” In fact, the simple wearing of cotton shirts next the skin will often prevent an attack of this affection, which would be inevitable were flannel shirts worn instead. As the skin of the horse is much more

sensitive than our own, we naturally admit the advisability of, in cases of humid tetter and other skin diseases, never putting woollen material next the horse's skin; a clean cotton sheet is here clearly indicated.

Owing to the similarity of the causes which affect the skins of horses at the same season from year to year, we often find humid tetter occurring once every twelve months in different animals at the same time, and almost always during the summer. If it occurs in winter it is then probably owing to irritation caused by dirty woollen clothing, want of grooming, or some constitutional disturbance which has checked perspiration.

Treatment.—Treat as for prurigo.

Non-contagious or Vesicular Ringworm.

This disease is almost identical with humid tetter, except as regards the form it takes. Here the eruption breaks out on separate portions of the skin in more or less rounded blotches. The causes are similar to those which influence the occurrence of humid tetter, and the treatment is the same in both diseases. "Should there be excoriations, an ointment of nitrate of silver, ten grains to the ounce of lard, should be used. If the eruption be associated with debility, as is commonly the case with young horses which have passed through an attack of a debilitating disease, tonics and good food are to be prescribed. Mr. Erasmus Wilson recommends that when herpes has become chronic a blister should be applied" (Williams).

Surfeit.

Surfeit is an eruption of small irregular lumps which break out suddenly on, generally, the horse's neck, loins, or quarters, the usual cause being acidity of the stomach, or some other disturbance of the animal's digestive organs. As the skin is continuous with the mucous membrane of the intestinal canal, a disturbance of the one structure is readily communicated to the other. These lumps, thus formed, tend to break into scabs. In some cases the hair on them scales off, "and, what is very peculiar, the hair never assumes its original colour, but remains white on the seat of the rash, the animal being ever afterwards spotted upon those parts where the rash was situated" (Williams). There is more or less itching of the skin.

Treatment.—Give a mild dose of physic and one ounce of bicarbonate of soda twice a day in the food for a few days. Keep the horse on light laxative food, and give a linseed mash every night. The bicarbonate of soda has a most soothing effect on the mucous membrane of the intestines; while the good effect of linseed in cases of irritation of the skin or mucous membrane is well marked. In obstinate cases employ tartar emetic, as directed for prurigo.

Hidebound.

Properly speaking, hidebound is a symptom of disease, and not a disease in itself; in fact, "what is called 'hidebound,' a condition where the skin seems to have lost pliability and softness, is a symptom of a general state of mal-nutrition, arising from indigestion, im-

proper food, worms in the intestinal canal, or a want of proper exercise, &c. A staring coat often accompanies the above-described conditions,—very often a staring coat is the only symptom of ill-health" (Williams).

Treatment.—In general the best means to bring the horse back to health, when in this state, is to keep him warmly clothed, well exercised, and to feed him on light and easily digested food; giving him, say, a linseed mash every night, and now and then a little boiled barley (2 to 3 lbs.) instead of dry corn, and a moderate supply of fresh grass and lucerne in place of a portion of his hay. In cases of debility accompanying hidebound, a capital tonic is—

Powdered cantharides	-	-	5 grains,
Sulphate of iron	-	-	20 grains;

to be given twice a day in the food. The sulphate of iron improves the quality of the blood, while the cantharides has a beneficial action on the skin, which may be due to a greater or less extent to its diuretic qualities. Tartar emetic, as for prurigo, may, with advantage, be occasionally substituted.

If the horse is troubled with worms, or if his liver is out of order, he should be treated accordingly.

Cracked Heels

Is the term applied to an inflamed state of the skin on the hollow and at the back lower part of the pasterns of the horse. It is similar to chapped lips or to chapped hands of the human subject during cold weather. In

the affected skin small cracks appear, while a watery discharge exudes from them. This discharge has not the same irritating effect as that of grease. The eruption is usually caused by the feet and pasterns becoming wet and not being dried soon afterwards. I have had horses in India frequently get cracked heels from going in the early mornings over ground on which the dew lay. Horses doing hard or fast work often get this disorder from the sweat running down and drying on the pasterns, especially if there be a sharp cold wind blowing at the time. An inflammatory state of the system is also alleged to be a cause of this complaint. It certainly has a predisposing influence.

Preventive Treatment.—As a preventive measure the feet should on no account be washed. In fact, all that is needed to keep them clean is the use of the pricker, brush, and rubber. If the feet happen to get wet they should be dried as quickly as possible; though, following the lesson to be learned from the preventive treatment of mud fever, we may conclude that if, during the cold weather, the feet be covered with mud for a considerable time, through a day's hunting for instance, it is advisable to allow the mud to dry on the feet and then to brush it off, instead of removing it by washing while the mud is still wet. Rubbing into the heels of the horse a little fresh butter or glycerine, half an hour before the animal leaves the stable, is most efficient in warding off an attack.

Treatment.—If the skin be simply rough, fresh butter or glycerine, applied as just mentioned, with oxide of zinc powder or burnt alum dusted on the part a few times a day, will generally be sufficient; or oxide of

zinc ointment alone may be used. If the skin be slightly broken, the affected part should be washed twice a day with water and soap (glycerine or carbolic soap for choice), well dried, and oxide of zinc ointment; a liniment composed of Goulard's extract, 1 part, glycerine, oil, or cream, 4 parts; or carbolic oil, 1 to 20, should be rubbed in. If the horse be worked, a little of the application—whichever one be used—should be applied half an hour or so before he quits his stall. If there be much inflammation present, apply a carbon or yeast poultice, or one made with boiled carrots. In India the common country carrots are best for this purpose, as they contain a large amount of tannin, which is a powerful astringent. In such cases no greasy application should be used, but the part should be treated with the white lotion or other astringent wash. Give bran mashes and greenmeat, and divide a drachm and a half of tartar emetic daily in the food for a week or ten days. In old cases, when the skin has become hard and scaly, blister the part by rubbing into it a little carbolic acid; this will generally bring on a healthy action.

Grease and Grapes.

Grease is an aggravated form of cracked heels, in which vesicles form on the inflamed skin. As a result of this inflammation the function of the minute oil glands of the part whose secretion renders the skin soft, and gives

a polish to the coat, is impaired, "and, as a consequence, the movements of the limb cause the skin to crack, and to become a mass of soreness, ulceration, and fungus, accompanied by heat, pain, and lameness. When the disease is of this type, it is very apt to assume a chronic character. The febrile symptoms along with the heat, pain, and lameness, diminish; but the swelling still continues, and the skin is constantly moist and greasy from the discharge, which is thick, foetid, and mats the hairs together" (Williams).

In bad cases red fungous excrescences appear on the affected part. These are commonly called *grapes*.

Although cracked heels are usually simply owing to the effects of wet or cold, both grease and grapes appear to arise from constitutional causes, aggravated by neglect. If the inflamed condition of the skin in grease be not speedily reduced, the swelling of the limb will often become permanent, owing to the exudation beneath the skin becoming converted into, as explained by Professor Williams, a low form of fibrous tissue, thus producing elephantiasis. Hence the necessity of prompt and early treatment. The limb never, I may say, regains its natural condition after the appearance of grapes, which is an affection unknown in all but the worst-managed stables.

Treatment.—Poultice the parts with yeast, turnips, or carrots, in order to remove the irritating discharge and to soothe the inflammation. Then pour over and rub into the affected surface crude carbolic acid, after having carefully washed it with soap and warm water. A second or even a third application of the acid may be necessary at intervals of a few days. During these

intervals the parts should be washed daily with soap and warm water, and after that apply—

Carbolic acid	-	-	-	-	1 part,
Glycerine	-	-	-	-	20 parts.

This will serve to soften the skin and to deodorize the part. To remove any heat and inflammation, poultices should be employed. Before exercise, a little glycerine may be rubbed in, as recommended for cracked heels. A dose of physic will generally be advisable, especially if the animal be of a full habit of body. He should also have a judicious change of food, with a linseed mash every or every second night. Tartar emetic may be used for a week, as recommended for cracked heels, and in obstinate cases an ounce of liquor arsenicalis may be given daily for a like period after that.

If grapes be present, they had best be removed in the manner described by Professor Williams. "For this purpose two blacksmith's fire-shovels are the best instruments; one to be made sharp at its edge, and heated to a *red* heat, to remove the excrescences; the other kept cold, and placed between the skin and hot shovel, to prevent undue burning." Shovels may be specially made for this operation.

Mud Fever

Is an ailment similar to cracked heels, being inflammation of the skin of the legs, which sometimes extends to the abdomen, and is caused by the action of moisture and mud; and particularly by the practice of

washing the legs after continued work through wet and dirt, as when hunting. There is usually a certain amount of fever present. The legs get very sore, and the horse has to be thrown by for some time.

The practice of clipping horses' legs is a strong predisposing cause of mud fever and cracked heels. If, after work through mud and wet—supposing the animal's legs have neither been clipped nor singed—the legs be not washed, but be allowed to dry of their own accord, he will rarely, if ever, get mud fever. The use of warm water, even with every precaution, is most liable to cause this affection.

“I strongly recommend the Irish method of clipping, namely, clipping all parts of the body except the legs. The hair that is left on the legs protects them from the irritation of wet and dirt” (Williams).

If the horse's legs have to be washed, use cold water only, quickly and thoroughly dry them with the rubber and by hand-rubbing, and put on flannel bandages. In my own stable I confine the external use of water to the animal's muzzle, eyes, dock, and sheath.

Treatment.—Treat as for cracked heels. If there be much fever present give a mild dose of physic—a pint of linseed oil for choice.

The best preventive measure is to allow the mud and dirt to remain on the legs till they have become thoroughly dry—say till next morning,—and then brush the dust off.

Bursatee.

This disease is, to the best of my knowledge, peculiar to India. As its name implies, it is most prevalent during the rains, *Bursat* meaning rain in Persian, and *bursatee* signifying something connected with that element. It appears in the form of unhealthy chancre-like sores, while "the parts of the animal more subject to its attack are those to which water is oftenest applied, viz., the legs and face" (Mr. F. F. Collins, M.R.C.V.S., in the *Veterinarian* for November, 1874). The fetlock joints, pasterns, yard, sheath, lips, and tongue are favourite seats of the disease, the first-mentioned part being particularly so. This liability is probably due to the thinness of the skin which covers this joint. Although I am unaware that any microscopic examination of the nature of this sore has up to the present time been made, still, I am strongly of opinion that Mr. Collins is correct in conjecturing that this complaint is due to the presence of a vegetable parasite. During the rains in India vegetable life bursts forth in uncontrolled luxuriance in the hot and moisture-laden atmosphere, which seems to be equally favourable to the development of bursatee, for if the animal be removed to the hills or to a dry locality, the sores will heal as if by magic, which makes it appear that the fungus—granting the truth of Mr. Collins' supposition—can only live in a damp hot climate. Again, if we destroy the sore and *effectually exclude air and water*, the part will readily heal as an ordinary wound. Here the subsequent exclusion of air and water, or the constant application of some material capable of destroying vegetable germs, is imperative. Abraded parts in an animal already suffering

from this disease seem to be readily attacked. My own experience coincides with that of General Ryves (Veterinary Aide Memoire), who states, "I have never seen the wound caused by castration, even in the worst month, assume this form; nor do I remember having seen any clean cut do so in a healthy horse." I have found that this complaint, like mange, is more virulent in badly fed animals than in those better looked after.

After the rains bursatee sores usually dry up gradually, but the true skin being destroyed, a bare patch, composed of fibrous tissue, replaces it. Horses that have once had this complaint are more or less liable to its recurrence, so an intending purchaser should view with suspicion any bald patches—indicative of bursatee—that may appear on the favourite seats of this disease. These bald patches of fibrous tissue being more sensitive to mechanical injury or to the attacks of a parasite (whichever theory we accept) than the unaltered skin, we find during succeeding rainy seasons that the sores are more liable to break out in the old spots than on other parts. This disease is not confined to horses in bad condition alone, but may also attack those enjoying otherwise apparently perfect health.

From a perusal of the Bengal stud records I learn that bursatee is not hereditary.

Mr. Collins has described the bursatee sore so correctly that I am only too happy to furnish my readers with the following extract from his article, instead of being obliged to detail my own less accurate observations.

Symptoms.—"The appearance of a bursatee sore differs from all other abrasions; it commences generally at an

unobserved spot, and gradually extends outwards from its centre, and when closely observed it impresses you with the belief that the disease is absorbing the healthy textures, or, to speak more pathologically, as if the disease produced a disintegration of the tissues immediately in contact with it, and then apparently utilized such decomposed tissues. The surface of the ulcer is dry, and if left exposed, dark in colour, having minute papillary-like points studding it, and exhibiting minute gallery-like sinuses running between these points into the substance of the sore. There is, I may say, no discharge, or if the moisture below the summit of these various papillary eminences might be called a discharge, it is of an aqueous character. The sore at first gives the idea of a dry cancer, but without a specific basis of attachment, and when manipulated, a hard root or kernel can be distinctly felt, which yields in every direction. Hard tissues are always avoided, but the softer structures prove a favourable locality for germination."

Treatment.—From the foregoing remarks it may be seen that the proper treatment is destruction of the part and subsequent exclusion of air and water. Mr. Anderson, V.S., R.H.A., informs me that his practice is to burn out the sore with caustic potash, and then to cover it with a mixture of—

Burnt alum	-	-	-	-	-	1 part,
Finely powdered charcoal	-	-	-	-	-	2 parts.

'As this falls off more should be dusted on, so that a constant and impervious coating may be applied to the part. Mr. Collins' treatment is as follows:—"When the disease

appears on any part capable of sustaining a bandage, I fill a fine-pointed hollow tube with one part of carbolic acid to twelve of water, and puncture the body of the ulcer in various parts, leaving a portion of the fluid when the tube is withdrawn. I then keep the parts dressed with carbolic acid and oil, one to twenty, on fine tow, and bandage over. Under this treatment I have found at once a healthy ulcer established. In parts not capable of receiving a bandage I insert minute portions of arsenic into the substance of the sore, which produces a slough of its centre; the attendant then applies the oil-and-acid mixture on every occasion that he enters the stable: such treatment is as effective as the preceding." He also advises constitutional treatment, which, I would suggest, might consist in the administration of a laxative—say a pint of linseed oil—followed by an ounce of liquor arsenicalis in the food daily for ten days or a fortnight, with change of diet and a bran and linseed mash every night. I recommend linseed and arsenic on account of the excellent effect they have on the skin. If the animal be in a low unhealthy condition we may give—

Powdered cartharides	-	-	-	5 grains,
Sulphate of iron	-	-	-	30 grains,

twice a day in the food instead of the liquor arsenicalis. An effective method of "coring" a sore is that described by Professor Williams, namely—take equal quantities of arsenic and corrosive sublimate, drive off the water of crystallization by heating them on a plate over a fire,* wrap up a little of the mixture, say three or four grains, in a pointed roll of tissue paper and insert it into the

centre of the ulcer through an opening previously made with a knife; this opening should be made in a manner which will prevent the paper from falling out. After a few days the ulcer will slough off, leaving a healthy wound.

Or we may employ carbolic oil, one of acid to three parts of oil, as the caustic in the first instance. Two or three applications of this will generally be sufficient. Afterwards use (in the manner directed by Mr. Collins) carbolic oil, one to twenty.

Following Professor Lister's antiseptic treatment of wounds, we shall find carbolic acid in all cases most useful in destroying animal or vegetable germs of disease.

Without committing myself to any theory, I can say with confidence that the disease may be cured most successfully and rapidly by following the broad principles—destruction of the part and subsequent exclusion of air and water—which I have described, and which I first learned from Mr. J. Anderson, V.S., R.H.A. As to supposed specifics, such as marigold ointment, black oil, *Egyptiacum*, &c., recommended by empirics, I can only say that their efficacy solely depends on the manner in which their application fulfils the conditions demanded by those principles.

As we find that local treatment, when it can be properly carried out, will in all cases cure this disease, I quite fail to see how it can be due to any morbid state of the blood; on the contrary every circumstance points to its being of purely local origin.

I am extremely diffident in discussing the pathology of a disease that has been so little investigated; how-

ever, I can hardly refrain from offering an explanation of the following fact: if a horse has had bursatee, and the sores have been allowed to heal of their own accord on the conclusion of the rains, the disease will, in all probability, make its appearance in the succeeding year on the very same dried-up sores; while if the part be destroyed and treated as I have described, there is but slight risk of its recurrence. Here it appears to me that in the former case the spores or germs of the disease lie latent in the part during the period of the year unfavourable to their development, in the same manner that grass does on our arid Indian plains; while in the latter case they get completely destroyed, and the skin, which we may regard as an animal soil, remains free from them until fresh seeds of this disease happen to fall on, and take root in it.

Warts

Are generally found on the lower part of the belly, on the lips, nostrils and eyelids, and about the sheath and penis of the horse, or udder of the mare.

The appearance and position of the excrescence will sufficiently indicate the proper means for its extirpation, whether by caustics, the knife, the scissors, ligature or by the firing-iron. The latter may be often used with advantage after the wart has been excised. On parts requiring delicate treatment, such as the eyelids or lips, the continued and careful application of vinegar or acetic acid may be tried.

CHAPTER III.

DISEASES AND INJURIES OF THE FEET.

THRUSH—CANKER—SANDCRACK—FALSE QUARTER—LAMINITIS, OR INFLAMMATION OF THE FEET—SEEDY TOE—PUMICED FEET—BRITTLE FEET—INFLAMMATION OF THE CORONARY BAND—NAVICULAR DISEASE—TREAD—PRICKS IN SHOING—WOUNDS OF THE SOLE AND FROG—CORNS—QUITTOR—SIDEBONES.

Thrush

Is a diseased condition of the sensitive frog, accompanied with an offensive discharge from the cleft. It may be brought on by the action of moisture, which decomposes the horny covering of the sensitive frog, and thus exposes it to irritation by foreign bodies; or by the absence of that pressure which is essential to its health. Both of these causes may be co-existent. In England, where the ground is always more or less wet, the former is the usual one; while the latter is more frequently to blame in the tropics during hot weather. In India, where the ground is hard, many horses with naturally high heels are very prone to thrush from want of pressure on the frog. Their heels, if not kept to a proper level, are apt to "wire in," and the frog becomes dry and shrivelled up. As the disease advances, fissures occur on the side of the frog, close to the heel, while a foetid discharge exudes from them. The foot acquires

a contracted appearance ; and in the event of a horse under these abnormal conditions falling lame, an ignorant or careless observer is very likely to assume the ailment to be navicular disease.

When caused by wet the frog becomes soft and pulpy. In all cases the presence of the disease is evident from the foetid smell.

Thrush is more frequently found in the hind than in the fore feet, because in badly managed stables the dung and urine of the horse is often allowed to accumulate under him for a considerable time.

Thrush is, I think, rarely induced by constitutional causes. To prove such a case it would be necessary to show that the affected foot had been kept perfectly dry, and that its frog had been subjected to pressure for a considerable time before the attack.

As far as I can learn, the only horses that are liable to thrush from constitutional causes are coarse-bred animals, with a tendency to grease or swelled legs.

In the tropics, maggots are sometimes found within the cleft of the frog of a foot suffering from thrush ; their presence, as may be expected, greatly aggravates the disease.

In neglected cases in hot climates red fungoid growths often spring up from the bottom of the cleft.

Treatment.—Keep the feet dry and avoid “ stoppings ” of every kind ; carefully remove with the drawing-knife or searcher any diseased or loose portions of horn, in order to prevent dirt or wet accumulating about them. Into whatever parts from which either discharge or odour issues, introduce calomel or burnt alum. Above

all things obtain pressure on the frog and keep the feet dry.

If the animal is actually lame from the thrush, give a dose of physic, and apply poultices for two or three days, in order to lessen the inflammation and to remove any offending matters, before using calomel or burnt alum.

In cases where the frog is dry and shrivelled up from want of pressure, take the shoes off and keep the heels as low as possible, short of making the animal go actually tender, and give exercise daily on dry soft ground. A month of this treatment, together with the use of burnt alum or calomel, will generally restore the frog to a healthy condition, and to nearly, if not quite, its natural size.

If maggots be present, those within reach should be picked out, while oil of turpentine or a little powdered camphor will remove any that may be left.

The juice of the leaves of the custard apple—a common fruit tree in India, and called in Hindustanee shurreefah—is frequently used by the natives of that country as an application for destroying maggots in any wound or diseased part. It is very efficacious.

If red fungoid growths be seen at the bottom of the cleft of the frog, they may be treated with powdered sulphate of iron, or sulphate of zinc, which is a more powerful astringent. In aggravated cases treat as for canker.

“A horse with a thrush should not be ridden without knee-caps; for if he bruise the frog, he will generally fall and cut his knees severely” (“The Horse Trainer’s Guide,” by Digby Collins).

“In the winter-time the frog denuded of its horn occasionally becomes frostbitten, leading to deep sloughing, which may even extend the navicular bursa, and causing great lameness” (Williams). Here physic, cleanliness, poultices, and warm fomentations, followed by mild astringents, as the white lotion, alum and water, or burnt alum, are indicated.

Canker.

Canker is a constitutional disease appearing on the ground surface of the foot, in the form of pale fungus-looking growths accompanied by a thin, foetid and nearly colourless discharge, which is profuse from the cleft of the frog when that part is attacked.

According to Percival the hind are oftener involved than the fore feet, and the frog than the sole. Generally the disease is not confined to one foot. As cart-horses are usually kept under far worse sanitary conditions than are better bred animals, and as their feet are, as a rule, much weaker and more liable to disease, we find that canker is almost entirely confined to them. Owing to improved stable management, it is now-a-days a rare disease.

Treatment.—As this is a most intractable disorder, I would most strongly advise a non-professional man not to attempt its cure. Very rarely can good here be done by half measures. For an exhaustive account of the radical treatment by stripping, I refer my readers to Professor Williams' most excellent work on Veterinary Surgery. Even in the best hands the

disease demands months of trouble, and is even then often incurable.

Sandcrack

Is "a longitudinal division in the fibres of the wall of the hoof, amounting to a flaw simply, or else to a cleft or fissure through the substance of the horn" (Percivall). The fibres of the outside horn of the wall (the crust), as well as the adhesive matter that holds them together, are secreted by the coronet; while "the very tough and natural state of the wall is maintained and preserved by the continual addition to it of horny agglutinating cells, secreted by the sensitive laminæ as it (the wall) descends over the foot" (Williams). Now if these conditions be prevented through mal-nutrition—for we must remember that the process of secretion from the coronet and sensitive laminæ are constantly going on—we may have separation of the fibres of the wall, as they are then no longer held together with sufficient tenacity to bear the strain of work, especially when it is of a fast nature and on hard ground. The fissure itself occurs in a moment, but the process leading up to its development is necessarily a slow one. Some horses inherit from their sires or dams weak feet, while all that are reared on wet marshy land have feet whose horn is more porous and ready to split, than is that of those brought up on dry soil. The pernicious system of using seated shoes, and of paring the frog, induces sandcrack by interfering with the healthy functions of the sensitive laminæ and coronet, in that an excessive amount of

strain is thrown on the secretory organs by the unnatural manner in which the crust of the hoof is called upon to bear the whole weight of the animal, instead of it being distributed, as nature intended it to be, between the wall, the crust, and the frog. Fast work and hard ground aid in inducing perverted secretion. If these influences be kept up for some months, until the entire hoof or a considerable part of it has been secreted under them, we shall have it in a condition to split, and thus to form a sandcrack at any moment, which it will naturally do at the point which receives the greatest amount of strain, that being usually the inner quarter in the fore, and the toe in the hind foot.

The injury first begins by a small fissure close to the coronet, which extends downwards and works deeper as the mischief is aggravated by concussion. In time the inflamed underlying tissues protrude through the crack, and get pinched and wounded as it opens and shuts during movement. The animal is now excessively lame, especially when the toe of the hind foot is the seat of the disease.

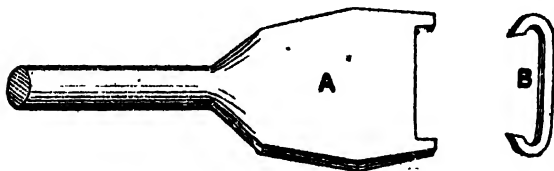
Mr. Broad of Bath was, I believe, the first to point out that the crack opens when the foot is raised from the ground, and closes when weight is put on it. This explains the great pain experienced by the animal with a bad crack at the toe, when he moves. On account of the greater amount of pressure thrown on the hind toe in progression, we find that sandcrack at that spot is much more serious than when at the inner quarter of the fore foot.

Treatment.—As the edges of the fissure cannot reunite, we must look to the growing down of the crack as

the only cure. If its upper extremity be some little distance from the coronet, we may burn with the iron or cut with the searcher a line across it deep enough to prevent the track from extending higher up; but if the fissure reaches the coronet, we must wait till it has grown down sufficiently to allow us to make this line. In either case the coronet may, with advantage, be stimulated to secrete stronger horn by rubbing into it, every second day or so, cantharides ointment reduced to half its strength by the addition of lard. A bar shoe—heart-shaped if the animal be required to go beyond a walk—should be applied, the sole and wall immediately below the crack being first eased off to avoid pressure. With sandcrack at the toe of the hind foot use a shoe with side clips, like those of hunting shoes. If there be no inflammation of the underlying tissues, and if the mechanical means be present, a clasp should be applied. This is done by heating the points of the instrument

Fig. 4.

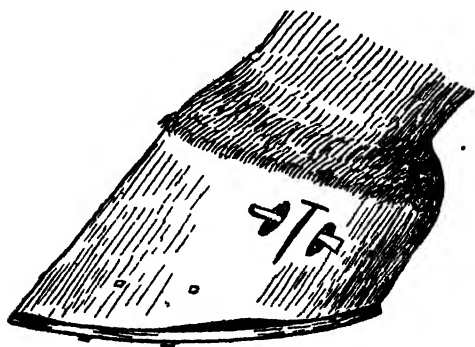
(Half actual size.)



A in the above sketch, and then by burning holes in the hoof with them at equal distances from and at opposite sides of the crack. The ends of the clasp *B* are now

fitted into the holes made by *A*, and the clasp is tightened by a powerful pincers, in order to bring the edges of the fissure closely together. This is an operation that any person may do. A second method of clasping, but one requiring the aid of a skilful smith, is to cut a small groove, about a quarter of an inch deep, at each side of and parallel to the crack, each groove being about half an inch away from it. A small broad flat horse-nail is now driven so as to enter at one groove and to come out at the other. The edges of the crack are brought together with the pincers; the head of the nail is cut off, and both ends are clenched.

Fig. 5.



Another method, which can easily be done at the toe, consists in drilling a hole through the horn at that part, and then using a round nail in a manner similar to the way just described. If the assistance of a good smith be procurable the former is much the best plan, though the latter is the safer of the two.

The advantage of clasping is that it prevents the crack from extending, and also saves the underlying sensitive tissues from being pinched between the edges of the crack when the foot is brought to the ground.

After this, the crack should be filled with gutta-percha or some other substance, so as to exclude dirt and wet. As soon as the fissure is clasped the animal may be put to slow work.

If these mechanical means be not available, I would advise that the edges of the fissure be opened out with the searcher, so that dirt or moisture may not lodge in it. It may be filled up with gutta-percha, and the hoof bound round with wax-end, so as to prevent motion as much as possible.

If the part be inflamed, the practitioner should " 'bottom the crack,' and allow the escape of matter, dirt, &c. ; remove the shoe, and give purgatives ; order ~~fermentations~~ fermentations and rest. A fungous growth is generally seen filling the fissure: this is the result of the inflammation, depend upon it, and disappears upon its subsidence. It must not be destroyed by caustic, for the application will add to the irritation " (Williams). When the inflammation has subsided treat as before directed.

If the sandcrack be of a very aggravated form, penetrating deeply and causing great lameness, it is best to "strip" it. This is done by cutting with the searcher two parallel and longitudinal grooves through the wall, having the fissure between them, each groove running parallel to and being about half an inch distant from it. These grooves should penetrate right through both the wall of the crust and the inner layer of horn, and

should extend from the coronet down to the ground surface of the wall. The depth of the groove should be regulated by the appearance of blood. After the portion of horn included between these two grooves is completely separated, its lower extremity should be detached from the sole, seized with a strong pair of pincers, and then torn right off, leaving the sensitive laminae completely exposed. Stripping may also be performed to a more limited extent by cutting the grooves in the form of the letter V. The method I have described is the better one for very severe cases. "If any remains of the sandcrack be seen in the sensitive laminae they are to be cut off with a sharp knife. Cold applications, bandages, and mild astringents, with rest, will constitute all the after treatment necessary, time being allowed for the growth of new horn before the animal is put to work" (Williams). During the operation of stripping the hoof, the horse should, of course, be cast, and should, if possible, be put under the influence of chloroform.

Throughout every stage of treatment the foot should be kept dry.

After the cure is effected use shoes that are perfectly flat on the foot surface, avoid "thinning" the sole, or even touching it with the knife; and obtain frog pressure, which may be done by keeping the hoof short, taking care not to interfere with the proper slope of the foot (from 45° to 50°), and by using tolerably thin shoes.

Sandcrack is an unsoundness.

False Quarter

Is a longitudinal depression in the wall of the hoof, owing to non-secretion of the horny crust by the coronet. This loss of secreting power is due to any injury, such as tread, or quittor, which destroys the part. The horn covering this depression is solely derived from the sensitive laminæ. (See remarks on Sandcrack.)

False quarter may commence at any part of the coronet, but is most common at that from which it takes its name.

It is an unsoundness. To guard against tricks in trade, before buying a horse have his feet washed.

Treatment—Can only be palliative. Here, as directed for sandcrack, try the effect of a blister on the coronet.

Laminitis, or Inflammation of the Feet.

We may regard laminitis under two forms, viz., acute and chronic; and may look upon the sub-acute form as an intermediate stage between the other two.

Professor Williams divides laminitis into two kinds: first, when the inflammation is confined to the sensitive laminæ and sensitive sole; second, when the inflammation also involves the coffin-bone from the outset. The former, if neglected, is apt to run into the latter and far graver form.

“If any particular shaped feet are more predisposed to it (laminitis) than others, it is the flat-soled, weak-crusted, and narrow upright feet (donkey-shaped)” (Mr. Broad).

The sensitive laminæ are continuation of the true skin, and cover the outer surface of the pedal-bone, at the lower margin of which they end, while they commence at the coronary band, which secretes the crust of the hoof. These laminæ consist of from five to six hundred folds, and their office is to secrete the inner and softer horn of the wall. They are plentifully supplied with nerves and blood-vessels.

ACUTE LAMINITIS is caused either by mechanical strain on the sensitive laminæ of the feet, or by inflammation extending from the mucous membrane or skin to the laminæ, all three structures being continuous one with another. When brought on in the latter manner, as a result of inflammation of the lungs, super-purgation, &c., it is said to be due to *metastasis*, or the shifting of the inflammation from one structure to another. This is not the true metastasis which we see in rheumatism, when the pain and swelling shift from one to another totally different part of the body. When arising from strain, Mr. Broad (Bath and West of England Society's Journal for 1869) considers that "the ordinary cause of laminitis in the horse is plethora and want of exercise, quite independent of size, whether a small pony or a heavy dray-horse. It is a question of fat and idleness." When a horse is very gross more weight is thrown on his feet than they are intended by nature to bear; while want of exercise induces stagnation of blood in the feet, which is further augmented by the perpendicular position of the legs. Besides this, as pointed out by Mr. Broad, high feeding favours the stagnation of blood, in that it tends to diminish its fluidity by increasing the fibrine and other solid constituents con-

tained in it. We see the evil effects of want of exercise in inducing this disease, when horses are kept standing for many days on board ship. To lessen the danger of laminitis appearing when taking horses by sea, their shoes should be removed and the crusts of the feet should be rasped down so as to get frog and sole pressure.

Mr. Broad states, "I have known it to occur to fat horses which have been at grass for months without having been haltered."

Long and fast work on hard roads, especially after a spell of idleness, is very apt to bring on an attack of this disease.

Acute laminitis induced by direct strain on the parts is much more intractable than when caused by so-called *metastasis*, while its development is greatly favoured by the pernicious system of using seated shoes, which relieve the sole from pressure and throw a double amount of work on the crust of the hoof. Added to this, if the frog be also deprived of pressure, the jar on the sensitive laminae is trebly augmented.

As explained by Professor Williams, there is an exudation—a natural result of inflammation—thrown out by the blood-vessels of the sensitive laminae, which accumulates at the toe, as that is the part of the foot which is most plentifully supplied with blood. I may here briefly explain that, as a result of inflammation, there is stagnation of blood in the vessels, which consequently become dilated by pressure. The walls of these vessels now lose their tonicity and an abnormal amount of the fluid and colourless portion of the blood transudes through them into the neighbouring tissues. In lami-

nit is this exudation, which forms at the toe, presses against the pedal-bone and horny crust (see *Fig. 1*). Now as the latter structure will not yield, the point of the former is forced down towards the sole, sometimes in fact penetrating it. In accommodating itself to its new position the pedal-bone gets altered in shape and structure, the toe and borders becoming absorbed, and its substance more or less honeycombed. Owing to its extremely porous and vascular nature this bone is enabled to accommodate itself to these new conditions.

Some pathologists maintain that exudation proceeds from the inflamed tissue itself, and not from the blood-vessels, instancing the fact that inflammation with exudation—as in inflammation of the cornea of the eye—occurs in non-vascular structures. This point of morbid anatomy does not concern us here.

Sometimes, but very rarely, the exudation occurs at the toe below the pedal-bone.

In slight cases of inflammation the exudation may become absorbed with little or no organic change occurring; but in graver cases the exudate breaks up, and there is a vacant space left between the horny crust secreted by the coronet, and the inner horn secreted by the sensitive laminae, which space becomes filled with a cheesy and imperfect sort of horn. This condition is termed “seedy toe.” The alteration in position of the pedal-bone also occasions “pumiced feet,” or convexity of the sole. “The sole being pressed upon by the point of the bone is forced downwards, losing its natural concave shape; whilst from the secreting powers of the sensitive sole becoming interfered with, partly arrested, or perverted, the horny sole remains weak, cheesy, or

spongy" (Williams). The entire sole both at the heel and toe becomes thin and weak.

As exudations tend to assume the character of the tissue upon and within which they are secreted, but at the same time in a degenerate form, we have the exudation here assuming the nature of the weak and imperfect horn seen in "seedy toe."

The second way in which laminitis may be brought on is, as before mentioned, by irritation of the mucous membranes or skin extending to the sensitive laminae; for instance, in cases of inflammation of the lungs, inflammation of the intestines, superpurgation, from irregularities in feeding or drinking, from chill, &c. As pointed out by Professor Williams. "the skin, mucous structures, and laminae are continuous one with another, and secretory;" so that what affects one rapidly extends to the other. "The irritation of the cutaneous surface may be very slight, scarcely observable; but the irritation of its foldings in the feet, surrounded by their unyielding case [the horny crust of the foot], becomes a source of pain; in fact, it may be said that this slight sympathetic irritation becomes the cause of an acute inflammation, because located in unyielding structures."

Mr. Broad (*Bath and West of England Society's Journal* for 1869) remarks, "I have lately had two acute cases in the same stable under treatment at the same time, the result of feeding principally on straw. I have also known it on many occasions to be the effect of eating an inordinate quantity of corn (wheat especially). I may also here observe that I have understood from a friend who has been some years in the State

of Illinois, in America, that the disease is there very common as a result of injudicious feeding upon maize."

As the fore-feet are far more exposed to the effects of concussion, and as they have to bear more weight than the hind ones, we generally find that they alone are implicated in an attack of laminitis.

"It is not very unusual to find all the four feet affected, sometimes the two hind-feet only, and in rare instances, one fore or one hind foot" (Williams).

General Ryves, referring to India, remarks in his "Veterinary Aide Mémoire" that, "laminitis almost invariably attacks the fore-feet; I have never seen a case to the contrary, and believe they are rare."

Symptoms of Acute Laminitis.—The horse will endeavour to relieve the walls of the affected hoofs of pressure, by, if the malady be in the fore-feet, stretching them forwards, and by bringing the hind-feet as much as possible under the centre of gravity of the body. But if the disease be confined to the hind-feet, the animal will draw back his fore-feet under his body, and will advance the hind ones, so as to relieve the toes of the latter of pressure. The horse evinces uneasiness in his feet. There is heat present, and the arteries which run down the pastern into the affected feet throb.

Mr. Broad, in the *Veterinarian* for April, 1877, remarks that he has sometimes observed "the temperature of the feet was not much above natural."

Tapping the foot lightly with a hammer causes pain. The horse is most averse to allowing any foot to be taken up, by doing which weight might be thrown on an affected one; he suffers great distress, especially when the hind-feet are attacked; he is most un-

willing to move. The breathing is hurried. At first the animal is generally very averse to lying down. "The mischief is very readily and unequivocally detected by pushing the animal backwards; if he winces under this, and is still unwilling to move, it is an unerring indication of the existence of the disease" (Dick). "To diagnose a case quickly, the best method is to push the animal backwards, when it will be seen at once that he will elevate his toes, and throw his weight upon the heels. The pulse of laminitis is full, strong, and accelerated; and it will maintain the character of strength and fulness even after general debility has manifested itself" (Williams). The pulse is fuller and harder in laminitis than in almost any other disease.

In bad attacks, the point of the pedal-bone may protrude through the sole, and also the hoofs may slough off: in the latter case, if the horse survives, the hoofs will be replaced in time by others of weaker and more imperfect horn; in the former case, in the event of recovery, the protruding point of bone will exfoliate, while the part of it which has been brought close to the sole will become more or less absorbed. I need hardly say that the result of such complications is to most seriously diminish the animal's usefulness.

Treatment of Acute Laminitis.—This disease is treated according to two most widely different systems. The old method is that of reducing the inflammation by local and general means, and by relieving the feet of pressure by putting the patient in slings or by casting him. To Mr. Broad, of Bath, is due the credit having devised the other method. Its chief characteristics consist in the employment of peculiarly

shaped shoes, which throw the weight that has to be borne by the affected feet as much as possible on their heels; and also in making the horse take exercise in order to relieve the congestion of the parts. Many of our best veterinary authorities are warm supporters of Mr. Broad's views on this subject. Professor Williams takes exception to giving the horse exercise, regarding, as he does, "that congestion is the result, and not the cause of the disease." As I am in no way competent to offer an opinion on this vexed subject, I shall content myself with detailing both systems.

Mr. Broad's System of Treatment.—"My first step in the way of treatment, whether the horse is up or down, is to get tacked on two extremely stout, wide-webbed, and long bar-shoes, made from iron about twice the ordinary thickness of those of the particular animal under treatment; make them gradually thin from behind the quarters, so that the heel part of the shoes may be as wide and thin as possible, and fitted rocker fashion to allow the weight of the horse to be on that part; put them on with leather soles, using only sufficient nails to insure their staying on for two or three days, by which time the greater part of the pain will have passed away, and then more nails can be put in if necessary. If the case be not a severe one, plain shoes, made after the same fashion, with leather will do, although I prefer the bar-shoes: if the heels of the feet are very strong and high, lower them; not, do not cut or pare the feet in any other way. I also give at once an ordinary dose of physic; and as soon as I can possibly get the shoes on I compel the animal to walk on soft ground, if convenient; if not, on the

road, or round his box for a short time, until a little of the soreness passes off. If the animal is so lame that he cannot be made to move without a person following with a whip, I order that to be done, knowing that, however much he may require it at first (cruel as it may seem), he will not want it more than two or three days, as the lameness decreases rapidly. In severe acute cases, if the exercise appear to distress the animal very much, continue it only about twenty minutes or half an hour at first, allowing an interval of from one to two hours before repeating it, after which it may be gradually increased, as the more he takes the sooner will the lameness be removed. Repeat the physic every third or fourth day (depending in a measure on the effects of the previous dose, although I never saw any ill effects from the repeated physicking in such cases), until the lameness is removed and the horse fit to work; do not then, from mistaken kindness, allow the animal to be turned to grass, or into a loose box for a month's idleness, but order him to be worked or exercised daily, otherwise there will be a liability to a recurrence, as it takes some considerable time for the vessels to recover their tonicity; it will also be necessary to continue for some time, in a modified form, the same principle of shoeing. Whenever I have a case near home I endeavour to get it away to my own stables, otherwise there is a danger of the instructions not being fully carried out. To this treatment I should have recourse even if I knew that the horse had done a hundred-r journey the day before. In cases arising from metastasis it is necessary to be careful as regards the physicking. Before acquiring my present mode of treatment,

I had tried general and local bleeding, frog setons, hot and cold fomentations, hot and cold foot-bath, with and without slings; I have also kept the animal down with the hobbes on, and used poultices of various sorts, with a variety of other modes of treatment, without any satisfactory result. Under my present system the only question is of being called in before any great alteration of structure has taken place." (*Bath and West of England Society's Journal*, 1869.)

Respecting the necessity of exercise, especially in cases resulting from fat and idleness, Mr. Broad further remarks: "In the case of horses thus affected the vessels quickly acquire their original tonicity and proper dimensions as soon as the strain, arising from determination of blood, is diminished by *exercise*; convalescence is then speedy, and restoration of the part complete."

"If from neglect or improper treatment suppuration at the coronet has commenced, or the pedal-bone is so far displaced that there is danger of its toe protruding through the sole, or if it is already through, keep the special shoes on, dress daily with hot tar until the opening in the sole has been filled up, and a particle of horny matter thrown out and become dry; after which, as soon as the horse can walk, get him into the wettest pasture that can be found, and if he is not excessively lame, take his shoes off, rasp the heels low, and shorten the toes, so as to bring the sole in contact with the ground. This operation is to be repeated every three or four weeks, which will in time insure sound and perfect feet as before the attack occurred, notwithstanding that all four of the pedal-bones may have protruded

through the soles; but it may require from six to twelve months before a new wall has grown down perfect, and the sensitive laminæ recovered their normal exudative powers. If the feet are not properly and regularly attended to they will not recover their natural shape, but will be deformed, especially at the toes. A wet pasture is essential, as the horn will grow as much in one month as it would in three months on dry ground.

“Should the horse be suitable for farm work, he may be used on soft land for months before he is fit for fast road work.” (Remarks of Mr. Broad in Professor Williams’ “Veterinary Surgery,” 1st Edition.)

The other System of Treatment for Acute Laminitis.—I have adapted the following from Professor Williams’ work on Veterinary Surgery, and also from his lectures.) On no account give a strong purgative, especially aloes, as we should avoid irritating the mucous membrane of the intestines. Give a pint of linseed oil, and assist the effect with an enema or two of warm water (100° F.) If there be already purgation, or if the fæces be covered with mucus—a condition which indicates irritation,—give no aperient. In the case of diarrhoea do not give astringents, as the purging is but an effort of nature to remove the cause of irritation. Remove the shoes and rasp the wall level with the sole, so as to allow the latter structure and the frog to bear weight. On no account pare the sole. Give the horse plenty of water to drink, and put him on laxative food. If the pain be very excessive give two ounces of tincture of opium, but do not do so if its use can be dispensed with, because we want to

ferent from that due to navicular diseases, which causes the horse to "dig his toes into the ground," and consequently to wear away his shoes in front. There will usually be some heat present in the affected foot or feet, especially after work. The peculiar position assumed by the horse when standing in the stable, trying as he does to throw the weight on the heels, is generally characteristic. There is more or less alteration in the shape of the feet, which usually become flatter, and their soles less concave than what is natural. Affected feet are as a rule distinguished by rings of horn which run irregularly, but close together, round the foot. The rings of a healthy hoof, as remarked by Professor Williams, are regular, and have wider interspaces than have those suffering from the disease in question. Sometimes horse dealers rasp the rings brought on by this ailment neatly away. A horse suffering from chronic laminitis does not work sounder when he warms up, as he does when affected by navicular disease.

"Seedy toe" frequently accompanies chronic laminitis.

Treatment.—In chronic laminitis, or in cases having a tendency to it, the sole and frog should be allowed to remain untouched by the drawing-knife, while the wall should be kept well rasped down; and shoes having the foot surface flat should be used, so as to put pressure on the sole as well as on the crust. Leather placed between the wall and the shoe by diminishing the effect of concussion, is often of service, though its presence will somewhat affect the hold of the nails. Pressure on the frog, which is the natural buffer of the foot, is most essential.

In bad cases use Mr. Broad's shoes, but if the animal be but little affected, an ordinary or heart-shaped bar shoe will be sufficient, and the heels may be somewhat lowered; for although this will throw an increased strain on the suspensory ligaments and back tendons, it will materially lessen the jar on the sensitive laminae—the lesser of the two evils. A little cantharides ointment, reduced to half its strength, should be rubbed into the coronet every second day or so, in order to stimulate it to secrete stronger horn. After work, if there be any heat present, the horse should be made to stand with his affected feet in warm water for some time. In the stable, tan will make the coolest bedding for him to stand on. If that be not procurable, he should have plenty of straw placed under him, and have the stall darkened so as to induce him to lie down as much as possible. Above all things, he should not be worked on hard ground, nor with a heavy weight on his back. With horses that are averse to lying down, slings might be employed, being fixed just high enough to allow the horse to rest on them if he chooses, without the webbing pressing on his abdomen when he stands up. Charlier shoes in some cases might be used, provided the wall of the crust be strong.

Seedy-Toe

Is the term applied to a cavity between the wall of the hoof and the inner layer of softer horn, caused by their separation; and is usually a result of laminitis (see remarks on that disease), though it also may be

owing to some mechanical arrangement, by which more strain has been thrown on the wall than it was intended to bear, as when seated shoes are used. The unnatural strain in such cases induces a mal-secretion of horn from the sensitive laminae, which horn is deficient in its normal gluey properties, by which, in a state of health, it was enabled to adhere firmly to the wall, hence the separation, which is usually of a limited extent when unconnected with laminitis. However, I have seen a very extensive case of seedy-toe brought on by a bad system of shoeing, seated shoes, soles pared out, heels allowed to grow long, &c., and by the habit the mare had contracted of never lying down.

Mr. Percivall mentions pressure of the clip of the shoe as the chief source of this ailment.

The separation of horn is not limited to the toe alone, but extends often to the quarters and high up to the coronet. The existence of seedy-toe is readily seen on removing the shoes. Sometimes the wall at the centre of the toe cracks, making a vertical fissure. There is frequently a depression a little below the centre of the front part of the hoof when viewed in profile. If the part of the wall which covers the cavity be tapped, it will emit a hollow sound.

When seedy-toe is not complicated by the presence of laminitis it hardly ever causes lameness, unless it be very extensive

Treatment.—Carefully remove with the searcher every particle of detached horn, until all appearance of a crack is gone, and the line of union between the wall and the inner layer of horn is seen smooth and undivided. Apply a bar shoe. Rub into the coronet, every second

day or so, a little of the cantharides blistering ointment, reduced to half its strength by the addition of lard, in order to stimulate the part to secrete sound and strong horn. Apply on the newly exposed surface a little of the following ointment every day, to protect it from moisture :—

Lard or suet	-	-	-	-	1 lb.
Venice Turpentine	-	-	-	-	1 lb.
Beeswax	-	-	-	-	2 or 3 oz.

As the horn grows down, look out for the appearance of any separation between the two layers of horn ; if such be perceived, carefully pare it out. Keep the feet dry.

For further reference see remarks on laminitis.

Pumiced Feet

Is a term by which we designate a flat or convex condition of the sole, due to the descent of the pedal-bone, as a result of laminitis. (See remarks on that disease). It may also be due to work on hard ground when seated shoes are used, without any symptoms of laminitis having been apparent.

The abnormal pressure of the pedal-bone interferes with the secretion of the horny sole, which accordingly becomes weak and thin.

Treatment.—In order to support the sole and to stimulate the sensitive parts of the foot to healthy action, gradually accustom it to the use of a flat, broad shoe, which at first may be thin only at the heels, but

as the foot becomes strong use one of uniform thickness, keeping frog pressure in view. Apply to the coronet blistering ointment in the manner recommended for "seedy-toe," and avoid work on hard ground.

Brittle Feet.

Use broad flat shoes, which will reduce the jar on the crust by throwing pressure on the sole; and obtain frog pressure. The shoes should be fitted on hot—in India and in other Eastern countries the custom is to fit them on cold,—as by doing so they remain firmer on, owing to the more exact juxtaposition of the horn and iron. Clips should be used to save the nails from being shaken; and for the same reason calkins should be discarded. Rather fine nails should be employed, as coarse ones are apt to chip away the crust. As recommended by the late Mr. W. Thacker, V.S., many years ago, the nail-holes should be punched well away from the outer edge of the shoe, so that the nails may take a good hold without having to be driven high up, which would be apt to start a chip off the crust. Keep the feet dry. Stimulate the coronet as advised for "seedy toe."

Inflammation of the Coronary Band, or Villitis,

Is characterized by heat and swelling of the coronet, accompanied by more or less scaling off of the horny skin round the lower margin of the coronet where it meets the wall of the hoof. As the presence of inflammation in a part interferes with its function, the horn secreted

during the continuance of this disease is weak, dry, and of diminished amount. There is "a peculiar striated or striped appearance of the crust, well described by Haycock in his essay on 'Villitis.' The peculiarity of gait is due to the animal trying to glide his feet along the ground. The duration of this form of lameness is variable, but it generally lasts a few weeks" (Williams).

Work on hard ground is the usual cause.

Treatment.—Remove the shoe. Give a dose of physic, and keep the animal on green food and bran mashes. Apply warm fomentations and poultices. When all heat has subsided stimulate the coronet as directed for "seedy toe," and shoe so as to obtain frog and sole pressure.

Navicular Disease.

To Professor Williams is due the credit of being the first to demonstrate the true nature of this disease; which is, primarily, inflammation of the navicular bone, or of the cartilage upon its lower surface. The inflammation extends to the synovial membrane, which lies between the navicular bone and the perforans tendon, and finally attacks this latter structure, the result usually being that the tendon becomes adherent to the bone, while the structure of the bone itself becomes diseased and weakened.

On referring to Fig. 1, we will see that the perforans tendon is attached to the base of the pedal bone, and passes behind the navicular bone, which forms a pulley for it. On leaving the navicular bone this tendon passes behind the pastern, fetlock joint, suspen-

sory ligament, the knee, and is finally united to the muscle (flexor pedis perforans) by whose contraction the foot is flexed.

Causes.—Formerly this affection was almost always put down to contraction, but “contraction of the hoof is not a cause, but an effect of disease” (Williams). Professor Dick supported the theory that sprain of the perforans tendon as it passes over the navicular bone was its usual cause. To this Professor Williams pertinently replies, “If navicular disease were due to sprain and laceration of the tendon, how is it that it so rarely affects the hind feet?”—a remark, I venture to submit, which might, with equal propriety, be applied to every other alleged cause except that of concussion; for concussion or jar during work falls far more heavily on the fore than on the hind feet. Were the practice of using high heels or calkins to blame, or were it even a predisposing cause to a very moderate extent, we certainly would have many more cases of navicular disease in the hind feet than the one or two isolated ones that have been met with in many thousands, especially as horses are usually shod higher behind than they are in front. Besides, a horse suffering from this complaint “goes on the toe,” which he would hardly do if the disease had been brought on by identically the very same course of action—raising the heel from the ground—by which he now strives to relieve the inflamed parts from pressure; which I naturally conclude to be his object for progressing in that manner. Again, a horse with navicular disease almost always goes better in a high-heeled shoe than in a low-heeled one; the reason for this being that the former relieves the navicular bone of some pressure by relaxing the

perforans tendon a little, and also, I think, by removing the navicular bone somewhat away from the pressure of the coronary bone ; for the more the toe of the coffin-bone is depressed—or the heel raised, which is the same thing—the straighter, or even the more *convex*, not the more *concave*, will the anterior aspect of the line formed by the pedal and pastern bones become. In fact, raising the heel tends to flex the joints of the foot and pastern.

Irregular exercise, especially if it be of a violent nature and on hard ground, naturally favours the development of this disease, for the parts, following a well-known law in animal economy, being thrown out of work during the periods of inaction, are less able to bear any unusual strain than they would have been had they been kept in healthy exercise. As observed by Stonehenge, feet with naturally high heels are more prone to this disease than are flat open ones ; for the latter conformation affords constant pressure on the frog, which keeps it, and the structures that it protects, in a healthy state and always prepared for work.

Navicular disease may in some rare instances be caused by stones, nails, &c., being picked up by the foot.

Owing to the greater jar experienced by the feet of cab and other horses used for quick road work, we find this disease more rife among them than among racehorses and hunters, whose tendons and ligaments are the chief structures that suffer, or even among cart-horses. As Stonehenge justly remarks: " Many tolerably confirmed cases of navicular disease may, therefore, be hunted, except when the ground is hard, supposing, of course, that they are kept off the road ; but no plan of manage-

ment will enable them to bear the jars incidental to harness-work or hacking."

Symptoms.—By actual examination of the foot the ordinary observer will discover little as to the nature of the ailment, though he may guess at its existence from the absence of signs of other diseases, while the peculiarity of the animal's gait, and the manner in which he "points," will tend to confirm his supposition. There is often contraction of the affected foot or feet.

Most horses "point" when standing at ease, but if sound, in an attitude which betrays no tenderness.

As a rule, the horse in this disease "points" by placing his toe on the ground, raising his heel, and rounding his fetlock joint and pastern in a peculiar manner.

The horse generally, unless the case be bad, walks sound, though when trotted he goes very "short," "daisy cuts," and "digs his toes into the ground;" the result of this latter habit being, especially if only one foot is affected, that the toe of the shoe or shoes gets worn in a very marked manner. Mr. Percivall remarks that in trying to save the heel the animal turns the toe in.

Travelling over hard ground affects him very much, particularly with a weight on his back; while probably he will be able to go free and well through plough or on other soft "going." He is usually a bad stumbler on account of being afraid to raise his feet high, and to throw pressure on his heels. The lameness wears off to a great extent during exercise, which of course affords only temporary relief.

The disease is generally insidious in its approach, there being often nothing to mark it further than that the horse commences the habit of "pointing" in the

stable, begins to go a little short, or becomes slightly lame now and then. The owner should not be misled by the lameness working off, but should endeavour to nip the mischief in the bud, for it will prove incurable if allowed to get beyond the first stages.

Treatment.—Remove the shoes, and if necessary rasp down the crust and heels so as to obtain frog pressure. The Charlier system of shoeing might be tried with great advantage. Give a dose of physic and keep on green food. Bleed from the toe or coronet. If there be a running stream at hand make the horse stand in it for a couple of hours two or three times a day; care being taken that the part of the bed of the stream on which he stands is soft, and that he has soft ground to walk upon, both going from and returning to his stable. Tan is, I think, the best material for his bedding, as it will tend to keep the feet cool. He should be put in a darkened stall by himself so as to encourage him to lie down as much as possible. Horses that are affected by this disease usually lie down a good deal. Poultices should be kept to the affected foot or feet. If a stream be not of ready access, buckets full of cold water should be used. After a fortnight, as recommended by Professor Williams apply to the coronet a mild blister, as—

Biniiodide of Mercury	-	-	-	-	$\frac{1}{2}$ drachm,
Lard	-	-	-	-	1 oz.

If after this the animal still continues lame, insert a frog seton, which may be kept in for three weeks. The ends should be tied so that the horse may not tread on them. After the seton is removed, the wound made by it should be examined so that vent may be given to any

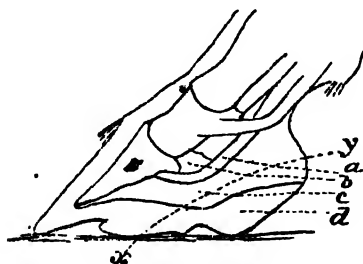
matter that may have formed. The accompanying sketch will shew the direction the needle should take.

Palliative treatment.—In confirmed cases use shoes having toes similar to those of the Thacker shoe, which are turned up so that no toe-clips are required, while the foot surface of the shoe bears on the sole as well as on the crust; and have the heels somewhat thickened. With this form of shoe, the concussion, caused by the horsestriking his toe into the ground, will be diminished, as much as possible, by the shock being distributed over the broad rounded surface of the toe of the shoe.

Fig. 6.

SECTION OF FOOT.

To show position of Seton.



xy Course of seton.
c Sensitive frog.
d Horny frog.

a Perforans tendon.
b Navicular bone.

Turning the horse out into a damp grass run for some time will often do good.

After everything has failed neurotomy may be performed.

Tread

Is the term applied to a wound inflicted upon the coronet of one foot by the shoe of the other fore or hind foot, as the case may be. The usual causes are weakness, fatigue, over taxation of strength, and carelessness in turning the animal. This injury is principally confined to carthorses.

Treatment.—If the wound be slight, apply a little tincture of myrrh or arnica. The spirit on evaporating will leave a thin resinous coating which will effectually exclude the air. Arnica stimulates the capillaries of the skin to absorb any effusion, and is therefore very useful in bruises. If the tread be severe, remove all loose ends, bathe the part with warm water and apply the white lotion, alum and water, or some other astringent. If the wound begins to suppurate, poultice for a day or so, but do not continue the applications too long as they tend to destroy the vitality of the structures. If after this, the sore does not assume a healthy appearance, apply a fly blister round its edges to stimulate the part to healthy action; the blister may be repeated. A neglected tread is very apt to run into quittor.

Pricks in Shoeing

Are caused by nails actually penetrating the sensitive parts, or by their being driven too close. In the latter case, the horse often does not go lame for a fortnight or more after it has occurred. I have frequently in India

remarked that in such instances the nail has been driven during dry weather, and that lameness did not occur until the subsequent appearance of rain, by which the horse's feet got wet and absorbed moisture.

The injury done by "drawn nails" is generally more serious and always more difficult of treatment than when the offending nail has been left in.

Treatment.—The seat of the lameness may be detected by pinching round the crust with a pair of pincers, one side being against the sole within the inner edge of the shoe, while the other presses against the wall of the hoof; or by tapping the wall lightly with a hammer. When removing the shoe, the nail or nails which are near the suspected spot should be examined, and if one be found to be wet, thereby indicating the formation of matter, that particular nail may be deemed to be the cause of the lameness. If any doubt exists, the sole should be pared, and if we find a stain round the hole caused by a nail on the foot surface of the horn at the point where the animal evinces tenderness, we may assume that we have discovered the seat of the injury.

The puncture should always be "bottomed," for if we fail to do so, a quittor is the very probable result, owing to the matter, which forms, not being able to find vent in any other manner. The usual way of bottoming is to pare out the puncture with a fine searcher from the sole surface, taking care to cut away from the sensitive parts so as to avoid injuring them, for if they bleed, it will be nearly impossible to follow up the course which the nail took.

When the point of the offending nail has come out

through the wall, I much prefer cutting straight down on the fissure it has made from the outside with a fine searcher, to excavating it from the ground surface, for by the former way there is a minimum of horn removed, the risk of getting too close to the sensitive structures is avoided, while the injured part itself is left exposed for the free application of fomentations, poultices, &c., conditions which are not obtained by the employment of the other method. If we are quite certain of the nail before removing the shoe, it is best to cut down on it before drawing it; but if the shoe be already off, a piece of wire or a thin nail might be passed through the hole to act as a guide.

After the fissure has been "bottomed," apply warm fomentations and poultices; do not cauterise the inflamed sensitive tissue that may bulge out into the cavity excavated, "as the supposed fungus is nothing more than the swollen tissues, which disappear when the irritation has subsided, like any other inflammatory swelling" (Williams). But if they remain sluggish after all inflammation has gone down, they should be touched with some caustic.

If there be any fever present, give a physic ball and keep the animal on laxative food.

In some cases the nail actually chips off a splinter, from the edge of the pedal-bone, which causes great inflammation and high fever. The presence of the piece of detached bone may be known by the foetid odour of the discharge, which will tinge a silver probe black, this colour being due to the formation of the sulphide of silver. The splinter must be removed without delay. If the fever be very high give the following drench

once or twice with an interval of a couple of hours :—

Fleming's tincture of aconite	7 drops.
Water	1 pint.

A quick, full and hard pulse will indicate the use of aconite, which is a sedative to the heart. If the pain be excessive give 2 ounces of tincture of opium, instead of the other.

Wounds of the Sole and Frog

Are occasioned by nails, pieces of broken glass, stumps of bushes, &c.

It often happens that when the offending substance has wounded the foot by penetrating the cleft of the frog, an inexperienced observer will imagine that the tendons or ligaments have been strained, on account of the inflammation extending up the leg. This swelling requires no treatment, as it will subside as the inflammation in the foot abates.

The navicular bone sometimes becomes fractured by puncture. There will then be a discharge of synovia tinged with blood, which will become dark and foetid. Recovery to a state of soundness after this accident is hopeless.

Treatment.—Remove the foreign body ; open out the part so as to allow of the escape of matter. Poultice and treat as directed under "Pricks in Shoeing." Remove the shoe.

Preventive Measures.—On no account thin the sole

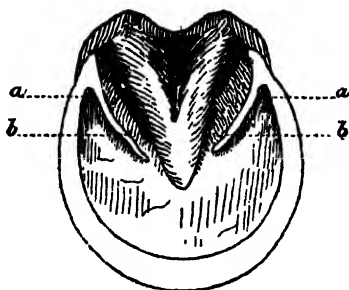
or pare the frog, but allow the foot to retain its natural protection. Do not use "stoppings" which will make the sole and frog soft and spongy.

Corns

Are bruises of the sole, generally found at the angle between the bars and the crust just in front of the inside heel of the fore-foot (see Fig 7). This spot,

Fig. 7.

VIEW OF THE GROUND SURFACE OF THE HOOF.



a Seat of Corn.

b The Bars.

within the junction of the crust and bars, is called "the seat of corn." At first the bruise is indicated by a stain due to extravasated blood, and may be readily detected on thinning the sole with the drawing knife immediately over the seat of the mischief. If the corn be neglected, suppuration will take place, with the pro-

bable result of quittor. They are almost always confined to the fore-feet, which are far more exposed to concussion than are the hind.

Causes.—The almost invariable cause is pressure of the shoe on the “seat of corn.” In some rare cases it is brought on by the animal treading on a stone or other hard body.

Preventive Measures.—Use narrow-heeled shoes, which are broad at the toes and taper gradually to the heels, so that at the “seat of corn” they may rest on the wall only, while anterior to that part they may bear on the sole as well as on the crust. Or, if ordinary broad-heeled shoes be used, ease off the “seat of corn” with the knife before putting them on. Keep the feet dry and do not use “stoppings,” as the moisture will soften the sole and render it liable to injury.

Treatment.—Remove the shoe. If there be inflammation, apply poultices. If matter has formed, give it vent by paring, and then poultice the part. If there be no suppuration, do not remove any horn beyond keeping the “seat of corn” level with the crust, but allow the bruise to grow down, for it is simply a result of inflammation, and no good can be obtained by removing it. On the contrary, paring out the “seat of corn” to remove this extravasated blood, deprives the sensitive parts beneath of their natural protection, and thus renders them liable to injury. Put on a three-quarter shoe, viz., one cut off just in front of the “seat of corn,” so that no weight may fall on it.

In bad suppurating corns, we sometimes find that the pedal-bone is implicated. This is indicated by the stinking odour of the discharge from the sore. The

part should be opened out, and any detached portion of bone removed. After that apply poultices.

A corn is an unsoundness.

Quittor

Is a fistula upon the coronet—akin to whitlow in the human subject—which tends to work down between the wall of the hoof and the sensitive parts of the foot. “It comes in the form of a hard conical tumour, hot and tender, on pressure; indeed sometimes so painful as to occasion considerable lameness” (Percivall). Usually it suppurates slowly.

Quittors are principally confined to cart-horses, and are generally caused by “treads,” and less frequently by neglected corns, pricks in shoeing, and other wounds which occasion inflammation in the sensitive parts of the foot. The result of such injuries is that matter when formed, being unable to find vent downwards, works gradually up to the coronet, and laterally round the sensitive laminæ.

Owing to wounds inflicted by the sharp calkins that are used during frosty weather, this disease is most common at that period of the year.

The cure of a quittor is, as a rule, a very tedious affair, which will generally occupy two or three months at least.

Treatment.—Remove the shoe, and if necessary pare the sole to discover if the quittor has been caused by a wound on that part. If such has been the case, make an opening from below, so as to allow of the downward escape of matter. If we find the tumour before it sup-

purates, then apply a fly blister, in order to stimulate it to healthy action. But if it is already discharging matter, poultice it so as to relieve the inflammation and then blister; these means, and the application of an astringent lotion will usually be sufficient to effect a cure. When a poultice is employed, a piece of thin muslin should be placed under it to prevent any of its contents getting into the sinus. If there be no depending opening, and if such simple measures as blisters and poultices fail, we must use some caustic. The great secret of its successful employment is, as pointed out by Professor Williams, to apply it only once or twice, and then to leave the part alone. After using the caustic, the part should be poulticed for about a week, the slough may then be removed, and the sore treated as a common wound, unless indeed it requires a second application. We may employ the method of "coring" described on page 54. Professor Williams recommends that when there is no opening down to the sole of the foot, the sinus should be opened up with the *bistouri caché*, and a solution of corrosive sublimate 1 drachm, water 1 ounce, with a few drops of hydrochloric acid to dissolve the salt of mercury, should be injected into it.

In bad quittors we often find that the pedal-bone or lateral cartilages become diseased. In such cases we may have to "strip" the portion of horn which covers the sinus. (See description of "stripping," under "Sandcrack".) In less aggravated cases where there is no communication with the sole, we may make a depending opening from the outside of the hoof by burning a hole through it with the pointed iron.

“ When fistulous openings are situated upon or near to the anterior surface of the coronet, great care and discrimination must be brought to bear upon their treatment, as the pedal articulation is there superficially seated and thinly covered by soft structures, and a free application of an escharotic is sure to cause the slough to extend into the joint ” (Williams).

Sidebones, or Ossification of the Lateral Cartilages.

The lateral cartilages are elastic continuations of the wings of the pedal-bone. They are placed above the heels; their office being, as pointed out by Professor Williams, to restore by their elasticity the position of the soft structures immediately above the heels when the horse raises his foot from the ground.

Sidebones are generally met with in the forefeet, and rarely affect any but cart-horses.

I think I may say that the majority of heavy cart-horses in large towns in England and Scotland are affected with this ailment.

This disease is due to concussion, assisted by the practice of using high-heeled shoes, which deprives the feet of the services of its natural buffer, the frog; and to hereditary predisposition.

Sidebones in aged cart-horses, that go sound and well, are of little consequence, especially when confined to the hind feet. The case with a saddle or harness horse is very different. They are, however, in all cases, legally an unsoundness.

The ossified cartilages may be readily detected by pressing the coronet just above the heels with the fingers; the cartilages, naturally soft and yielding, will, when ossified, be hard and inelastic.

Symptoms.—There will be a hard swelling at the back of the coronet and heels, with heat and tenderness if in the early stage; later on, the part becomes hard and callous. If lame, the horse goes on the toe and short, thus somewhat simulating the symptoms of navicular disease, but here one can easily decide the case from the state of the parts. Sometimes the cartilage of one side only is affected; the animal will then “dish” the leg either outwards or inwards, as the case may be, so as to relieve the affected side. In a case of sidebones the horse never walks with a free elastic step.

Treatment.—Use a bar shoe so as to get pressure on the frog. Foment the part. Stop work. Blister or fire the part so as to hasten the process of ossification, on the completion of which the inflammation will cease.

CHAPTER IV.

DISEASES OF BONE.

SPLINTS—SORE SHINS—RINGBONE—BONE AND OCCULT SPAVIN.

Splints

Are bony deposits which usually appear on the upper and inner third of the cannon and splint bones of the fore-leg.

Solleysell, followed by Percivall and Williams, divided splints into five classes, viz. :—

1st. The simple splint, which is away from the knee, and does not interfere with the tendons and suspensory ligament. It is not an unsoundness, provided that it neither causes lameness nor interferes with the action of the other leg.

2nd. The double or pegged splint, “which occurs when there are two splints, one upon the outer, the other upon the inner side of the leg, directly opposite to one another, as though they were *pinned* together through the leg, from which they derive the denomination of pegged” (“Compleat Horseman”). The existence of this bony communication on the posterior surface of the cannon-bone may always be inferred from that of the two deposits just described. In fact, this pegged splint is *one* bony deposit, not two, and of necessity can hardly fail to interfere with the action of the suspensory ligament.

3rd. The splint close to the knee.

4th. "Two splints joined at the ends, one above the other;" or, as more correctly described by Professor Williams, "two or more exostoses upon one side of the leg, one above the other, with perhaps an osseous communication." This form shows considerable weakness of the bone, and almost always causes lameness, especially when the two splints are united by a bony ridge.

5th. A bony deposit involving the metacarpal bones (the cannon and splint bones) with those of the knee, with which they articulate. This horny union or ankylosis usually occurs between the head of the internal splint-bone and the lower surface of the small bone—the trapezoid—of the knee with which it articulates.

The fact that splint occurs more frequently on the inside than on the outside of the leg, may be readily understood if we glance at the anatomical construction of the bones of the fore extremity; for we will find that the internal articulating cavities on the os suffraginis and os coronæ (long and short pastern-bones) are larger, and are consequently intended to bear more weight than the external ones, while the internal splint-bone is thicker and often longer than the external. These facts prove that more weight is thrown on the inside than on the outside of the leg, and consequently the former suffers rather than the latter from the effects of concussion, while nature, to equalize matters, strengthens by a bony deposit the part on which the shock falls heaviest.

Young horses (five years old and under) are most

liable to splints, for their bones are more vascular than at a more advanced age, when the elements of nutrition are supplied to the bones by the blood-vessels in a proportionately decreased amount. We may also justly conclude that the younger the horse, the greater probability there is of his becoming lame from a splint.

Quick trotting work, especially on hard ground and under heavy weights, is the usual cause of splints. Hereditary predisposition is well marked, and also the formation of the legs themselves induce liability to this disease, especially when the animal is heavily "topped." I think I may say that, as a rule, underbred horses, and those reared in damp climates and on succulent food, are more liable to splints—supposing that they be put to quick work—owing to the more porous nature of their bones—than are better-bred animals, and those that are brought up under healthier conditions.

A splint on the outside of the leg causes generally more greater lameness than one on the inside. The lameness caused by a recently formed splint is in no wise proportional to the size of the splint itself, for often small splints cause extreme lameness, while sometimes large ones occasion little or no inconvenience. In the former case the lameness is probably due to inflammation deeply seated in the bone, while in the latter the increased action may be almost entirely confined to the periosteum (the covering membrane), which "grows as the tumour grows, and so accommodates itself to the increased superficies it has to spread over, without suffering any tension" (Percivall). In the one case we may conceive that previous violent concussion has set

up inflammation in the substance of the bone itself, which, being of a hard and unyielding nature, does not allow expansion of the blood-vessels that line the minute canals (Haversian canals) which ramify through the bony tissue, acute pain being the natural result of this constriction. In the other case, that the process is an effort of nature to strengthen a part which was not originally strong enough to perform the work demanded of it; the strengthening process taking place on the surface of the bone by means of the periosteum. An exaggerated form of inflammation in the substance of the bone may occur from the effects of violent concussion, when instead of a splint being formed, the effusion, failing to get vent, is deposited in the substance of the bone, thus preventing that part from receiving nutrition by blocking up its canals, the result being that death of the affected portion of bone ensues. Respecting the structure and nutrition of bone—a subject demanding some study—I must refer my readers to one of the standard works on Physiology—that by Carpenter, for instance.

A splint that interferes neither with the knee joint, nor with any tendon or ligament, causes lameness only during its period of formation.

In the majority of cases, splints occasion little lameness, and are of trifling consequence as far as the usefulness of the horse is concerned.

Symptoms.—"A splint is detected by grasping with the hand the horse's suspected leg in the ordinary manner in which we *feel* the leg, and tracing, with the fingers upon one side and the thumb upon the other, the inner and outer splint-bones from their heads

downwards to their tapering extremities. Any actual exostosis will at once arrest the hand; any rising or irregularity will create suspicion and lead to closer examination" (Percivall). On the other hand, as remarked by Professor Williams, "the lameness may precede the appearance of any swelling or deposit, and in such a case it is apt to be confounded with that arising from other diseases." He further teaches that on this account, in the examination of a case of obscure lameness, especially if the animal be young, one should never fail to look out for the signs of splint-lameness, namely, that the lameness at the trot is out of all proportion greater than that at the walk; that the animal usually fails to bend the knee freely, and that exercise increases the lameness. The latter condition is also present with corns, but an examination of the foot will readily determine their existence. Young horses with obscure splints causing lameness are often suspected of having navicular disease, and get rejected accordingly. Respecting this, one should recollect—1st, that the lameness of the latter affection wears off as the animal becomes warm with exercise; and 2ndly, that horses five years old and under very rarely indeed are troubled with navicular disease.

If the swelling causing the lameness be perceptible, there will be heat and pain on pressure.

Treatment.—If the newly formed splint does not produce lameness it should be left alone, and if possible the horse should be kept on laxative food of a diminished amount, and his exercise restricted to light work at a walking pace on soft ground, until the splint is fully formed, and all inflammation has left the part.

If the lameness be slight, give a purgative, allow very little exercise, apply hot fomentations, and give a long rest; but if this be not sufficient, rub in a little biniodide of mercury ointment (1 to 30 parts of lard) every second day or so, in order to hasten the process of formation. When the splint is of the fifth order, *i. e.*, involving the bones of the shin with those of the knee, stimulate the part with the biniodide of mercury, so that considerable irritation may be produced; this will hasten the process of ankylosis (stiffening of the joint by bony union). If the lameness be very great, perform periosteotomy without delay, and cut boldly and deeply into the new growth, so that the inflammation may be relieved by the bleeding from the congested vessels within the bone, as well as by division of the stretched periosteum. I need hardly say that this operation should never, owing to the danger of producing open joint, be performed in the vicinity of the knee. After periosteotomy, a seton should always be passed over the divided structures, the needle should enter the aperture which is already made in the skin, and may come out a little higher up than where the point of the knife penetrated. In order to obviate the chance of a blemish, the seton should on no account be allowed to remain in longer than a fortnight.

When a splint interferes with the action of the opposite fore-leg, it may be carefully dissected down upon and removed with the bone forceps or gouge.

Sore Shins

May be said to consist of bony formations on the lower third of the cannon-bones. The deposit is usually on the front of the bone, hence the name. The disease being due to concussion, it is almost always confined to the fore-legs, although I have seen, in the case of a young race-horse, all four legs implicated; in fact, after the growth had formed, the cannon-bones of the fore as well as those of the hind extremities presented a distinctly bowed appearance on their anterior surfaces. Like splints, sore shins are far more common among young horses than they are among older animals, (this being due to the greater vascularity of their bones); but, unlike the former, they are confined almost entirely to race-horses, because in the gallop, the heel is brought to the ground at a moment that the cannon-bone is somewhat extended; and as the shock is transmitted vertically upwards from the heel, its effects will be felt at the lower part of the cannon-bone, *i. e.*, at the seat of sore shins. In the trot the heel meets the ground when the cannon-bone is in a much more upright position than it assumes in the gallop, in fact the foot comes, as nearly as possible, flat down; hence trotters seldom suffer from sore shins, although they are subject to splints.

Sore shins is a most serious disease, in some cases even involving the life of the animal.

Symptoms.—The first symptom generally perceived is that the horse begins to go a little “short” in his gallop, especially if the ground be at all hard, although he may act as well as ever through “dirt.” On being pulled up after a strong gallop, he may be found to walk

very sore and tender, although hot fomentations and a rest for a day or two may set him right to all appearance. To develop the symptoms, all that is required is to put him to fast work again without loss of time, and probably after the next gallop he will be found to be hardly able to hobble along at a walk; there will be swelling above and in front of the fetlock joint or joints, as the case may be. The swelling will be elastic and fluctuating at first, then dropsical, and will "pit" on pressure, and finally it will become hard; the case being, as explained by Professor Williams, that originally the swelling was due to thickening of the periosteum and to the presence of an exudation beneath that membrane; secondly, that effusion took place into the cellular tissue which lies beneath the skin; and thirdly, that the exudation beneath the periosteum became organized into bone. During the first or acute stage, the swelling will be painful to the touch. The horse will be lame and go very "short." There will be more or less fever. The animal will keep shifting his feet if both be affected, or point the toe and flex the fetlock joint if one only be implicated.

Treatment.—From the foregoing remarks it will be seen that the disease should be combated on its very first onset, when a dose of physic, hot fomentations and a long rest will generally complete the cure. After a week, or when the pain and heat have subsided, the hot fomentations may be succeeded by cold applications. If after another fortnight or three weeks, the swelling still continues, the part may be stimulated by a blister of the biniodide of mercury, 1 to 16 of lard. In the first instance the shoes should be removed, a purgative given,

and the horse kept on laxative food. If the fever at the outset of the attack be great, as indicated by a quick, full and *hard* pulse, the following drench may be given:—

Fleming's tincture of aconite	-	7 drops.
Water	- - - - -	1 pint.

This may be repeated once or twice.

N.B.—Never use aconite if at all uncertain about the nature of the pulse.

Instead of aconite, a couple of ounces of tincture of opium may be given if the pain seems to be much in excess of the fever.

During the acute stage, if the swelling be very extensive and the pain great, periosteotomy must be performed without loss of time, in order to admit of the escape of the exudation, which, by the pressure it exerts on the inelastic and highly sensitive periosteum, is the cause of the intense pain and fever. Besides this, if the exudation be very great, and it be allowed to remain between the surface of the bone and the periosteum, death of the bone (necrosis) may ensue later on; the process being that when this exudation is subsequently converted into bone, it will block up the small canals through which the bone receives nourishment by means of small blood-vessels proceeding from the periosteum. Before operating, one should carefully feel for the position of the extensor tendons, which run down the front of the cannon-bone, so that these important structures be not injured. The skin should then be pinched up, and the incision made well away from where the subcutaneous opening into the periosteum is to be effected. If the skin is very tense, make the incision

through it with a sharp bistoury, and then use a blunt-pointed one. In all cases be particular to make the incision into the skin as small as practicable, in order to prevent entrance of air into the wound as much as possible. In this operation the employment of Dr. Lister's method of destroying the germs contained in the air entering the wound by carbolized spray is well indicated.

In mild attacks of this disease periosteotomy should never be performed. An ordinary case will yield to a purgative and hot fomentations, followed by cold applications and a blister later on.

"In some rare cases the exudate becomes converted into a thin, sanious (bloody) matter, which corrodes the surrounding tissues, causing great febrile disturbance, and the death of the patient from its absorption into the general circulation" (Williams). When this condition is perceived periosteotomy should be performed without loss of time.

After a case of sore shins, a rest for at least six months should be allowed, and when the horse is put again to work he should be exercised only on soft ground, so that there may be a minimum of the original cause of the disease, namely, concussion. I need hardly say that at first the work should be confined to walking, trotting, and slow cantering. When the horse is put to a faster pace the gallops should be short, and, if need be, repeated, with half an hour or so of walking allowed between, so that the bones of the legs may be saved from long-continued jar. The advisability of warm fomentations after a gallop will naturally suggest itself to the trainer.

An attack of sore shins, in which the exudation has been extensive, will give a more or less rounded appearance to the front part of the shin when viewed in profile.

Ringbone.

Ringbone is a bony deposit, the result of inflammation, which forms on the upper and lower pastern-bones and the pedal-bone (see Fig. 1). It is of three kinds, viz.—1. False ringbone, which may be regarded as a splint on one or both sides and towards the middle of the upper pastern-bone; in some cases it extends to the front of the bone. It is of little consequence, as it does not affect the joint, and is not to be regarded as an unsoundness unless it causes lameness. 2. High ringbone, when the deposit involves the joint between the upper and lower pastern-bones. 3. Low ringbone, when the bony formation affects the lower pastern and pedal bones. The latter is by far the most serious kind, owing to the unyielding nature of the horny wall of the hoof which surrounds the affected joint. The second variety is the most common, and may be readily seen in the form of a swelling in front of the pastern on looking at it in profile.

These bony deposits are usually confined to the front and sides of the bones, and have a tendency to surround those parts. If they extend to the rear of the joints they cause most intractable lameness. Ringbones, especially the false kind, are generally confined to cart-horses. In the fore-feet they are most probably due to concussion; in the hind, according to Professor Williams, to strain of the capsular and lateral liga-

ments of the pastern joint. They are more common in the fore than in the hind feet.

While in Edinburgh, I saw an instructive case of lameness from ringbone, which had been induced by the horse "going on his toe," owing to a previously existing spavin.

In the early stages of ringbone, a horse becomes lame before any deposit is formed or any swelling takes place, for here the cause of the pain is inflammation in the structure of the bone itself. When lame from this cause in the fore-foot, the horse goes on the heel; when in the hind the toe comes first to the ground, "From this peculiarity in putting the foot to the ground it is apt to be confounded with laminitis, seedy toe, and inflammation of the coronary band. It differs from laminitis by the absence of pain at the toe, freedom from fever, &c., and by the heat being confined to the upper part of the foot only.

"An examination of the foot will determine whether there be a seedy toe or a sand-crack in its front, and the absence of the striated appearance of the wall of the foot will distinguish it from inflammation of the coronary substance" (Williams). Writing about ringbones the same author remarks, "When at the sides they do not cause the same degree of lameness as when the front is involved."

As in spavin, so is hereditary predisposition in ringbone well marked.

Ringbone must not be confounded with sidebone, which is ossification of the lateral cartilages of the foot.

Treatment.—First give rest to the parts by using, if the horse goes on his heel, Mr. Broad's shoe (described

under laminitis). If on the toe, employ a high-heeled shoe. Apply warm fomentations to reduce the pain, and afterwards fly blisters to hasten the bony union (anchylosis) of the affected joint.

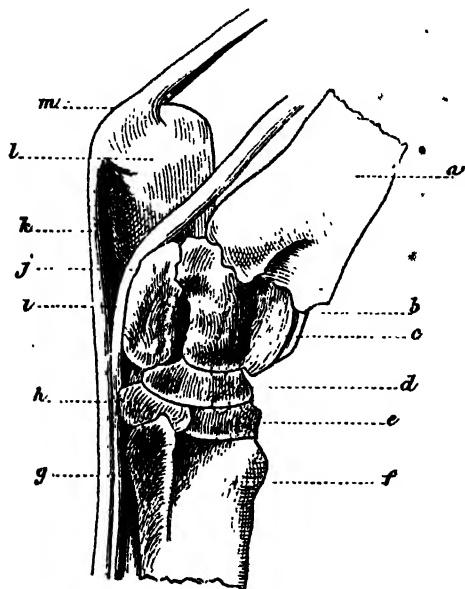
Bone Spavin.

In the hock (vide Fig. 8) we have the true hock joint formed by the astragalus and tibia, which serves for the flexion and extension of the cannon-bone, while to diminish the effects of concussion there are the cuneiform medium and magnum placed, one over the other, between the cannon-bone and astragalus. Following Percivall, we may call these two cuneiform bones the upper and lower cushion-bones. Thus we have four joints, viz., the true hock joint formed by the tibia and astragalus; that between the latter and upper cushion bone; the one between the two cushion-bones; and the joint formed by the lower cushion-bone and the cannon-bone.

In bone spavin, as a result of inflammation, there is a deposition of bone on the inner and lower part of the hock, commencing usually between the lower cushion bone and the cannon, or between the two cushion-bones. The higher this bony formation or exostosis extends, the more serious is the disease. When the spavin is low down, being simply confined to the joint between the lower cushion and the cannon-bone, it is of little consequence, as bony union or anchylosis of that joint does not affect the horse's action to any appreciable extent.

Fig. 8.

DIAGRAM OF INTERNAL ASPECT OF THE BONES OF
THE HOCK, WITH FLEXOR TENDONS.



a Tibia.
b True hock joint.
c Astragalus.
d Cuneiform magnum
e Cuneiform medium.
f Cannon bone.
g Internal splint bone.

h Cuneiform parvum.
i Perforans tendon.
j Tarsal groove.
k Perforatus tendon.
l Os calcis.
m Point of the hock.
 Dotted circles mark sites of epavin.

Mr. Percivall very justly lays a good deal of stress on the fact that horses should not be condemned indiscriminately on account of having a so-called low spavin, which, he contends, is a veritable splint in many cases, having no connection with the cushion-bones. "Nothing is more common than to meet with horses—colts even—who have what the dealers call 'knots' in their spavin places; and the time was when such 'knots'—which have always been regarded as spavins—were certificated as constituting unsoundness. This was professional decision which met with a good deal of opposition at the time, and justly so, and the result has been that such 'knots' are now allowed to pass as compatible with soundness."

I would say that a splint, bearing the appearance of a low spavin, rarely occurs on the head of the cannon-bone without involving the lower cushion-bone also; although bony union of these bones frequently takes place without affecting the action of the animal in any perceptible manner, as there is very little motion indeed in that joint. The lower cushion-bone at the seat of spavin has a naturally well-marked bony ridge on its surface, giving it the appearance of having a small splint. The reader may satisfy himself on this point if he takes the trouble of examining the bone in the dead subject.

If the exostosis occurs towards the front of the hock it generally causes serious lameness.

The lameness of spavin in horses six years old and under is usually curable, not so that of old horses (see remarks on occult spavin).

Coarse hocks need not be viewed with suspicion if both be exactly similar and there be no lameness.

If an "aged" horse has coarse hocks and goes sound there is little probability of his becoming lame in them.

Young horses often have enlarged hocks, which fine down as they grow older.

In naturally coarse hocks the cushion-bones are large, hence best adapted for diminishing concussion.

The usual causes of spavin are concussion and sprain of the hock, the latter being brought on by jumping, putting the horse on his haunches in military riding, &c. Spavin is very common among horses owned by natives in India, as they like to ride them with severe bits and standing martingales.

Hunters are liable to spavin, as the stress is thrown particularly on the hocks while leaping. For this reason good hocks are indispensable in the cross-country horse. Mr. Percivall remarks, "We do not so frequently observe spavin in race-horses and horses that have lengthly, blood-like quarters; neither are 'sickle-hocks' nor 'cow-hocks' thereto disposed: this may arise from their experiencing less concussion than hocks of another description." The obvious reason that race-horses do not so often suffer is that with them the weight of the rider is thrown forward, while they are not "collected" in the same manner as the hunter or charger; besides this, they are usually ridden in a snaffle.

In cart-horses high calkins induce spavin on account of their causing the weight to be more directly thrown on the cushion-bones and the head of the cannon-bone; than is done when the heels are low; this is especially the case when the animal is going downhill with a weight behind him.

Horses "tied in" below the hock are naturally

subject to spavin. The tying in consists of the cushion-bones and the head of the cannon-bone being small, hence a diminished surface over which concussion has to be distributed. This conformation gives the hock a short and weak appearance.

Hereditary predisposition is well marked in this disease; on this account, if practicable, mares and stallions suffering from it should not be employed for breeding purposes.

Occult Spavin is the term used to signify that condition of the hock in which no external evidence of disease can be observed, although the lameness due to pain in the part may be of a most inveterate form. We have here ulceration of the articulating surfaces, *i. e.*, ulceration of the surfaces of the bones which oppose each other to form the joints. In health the bones of a joint never touch, as they are always separated by articular cartilage. In ordinary bone spavin this cartilage becomes ulcerated as the result of inflammation extending from the bones, and is finally absorbed, while the exudation thrown out from the bones is converted into a bony material, which causes ankylosis. Here we have a reparative process with cessation of inflammation. Now in occult spavin the process stops short at ulceration, and no reparative action takes place at all; hence the very serious and intractable nature of this form of the disease. Occult spavin is naturally much more common in old than in comparatively young horses, as in the latter the materials of repair are much more abundant than in the former. As the inflammation, and not the deposit, constitutes the disease, we must regard bone and occult spavin as one and the same complaint.

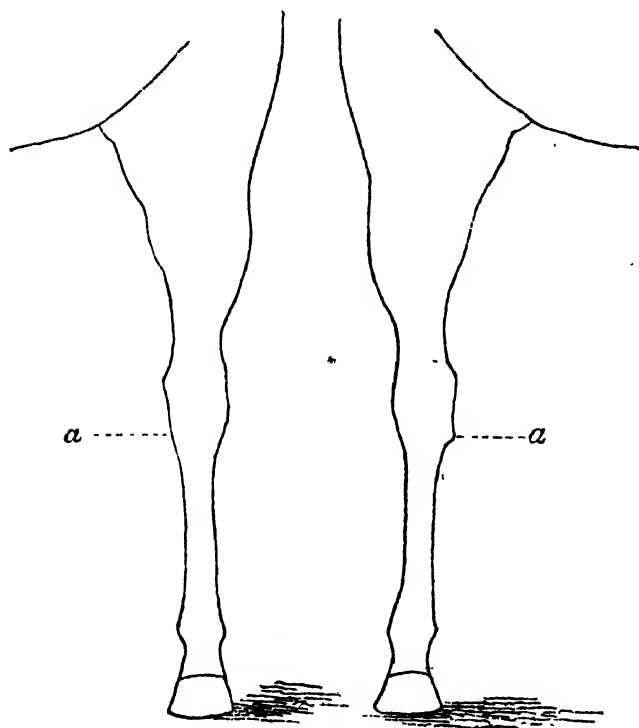
Symptoms.—The lameness of spavin is characterized by want of flexion of the hock—which causes the horse to go on his toe and wear the shoe at that part,—and by the lameness getting better as the horse “warms up” at exercise. In severe cases, and especially in occult spavin, where there is ulceration of the articulating surfaces, the lameness “consists in a sort of spasmodic catching up of the spavined limb the moment the heel of the foot comes down upon the ground, something after the manner of stringhalt” (Percivall). Sometimes the stiffness can only be observed when the animal is pushed over from one side to the other in his stall. “The time of all others when a spavined horse will be apt to manifest his lameness will be the day following after a hard day’s work; and when he makes his first egress from the stable in the morning is the critical period for examination” (Percivall). Therefore we should be prepared to form our judgments quickly in these cases, for the longer the animal is trotted up and down before us, the sounder will he generally become. At the end of each trot past he should be turned a different way; I mean first to the left about, then to the right about, so that one may see on which hind leg he turns best. If there still be a doubt, the foot of the suspected leg may be taken in the hand, drawn upwards and held, so that the hock may be kept flexed for a minute or two, and then let down. If disease be really present, lameness will then almost always become very apparent if after that the horse be trotted.

We may have the visible sign of spavin without lameness at all, namely, swelling at the part. If there be heat and tenderness on pressure, lameness will also be almost

Fig. 9.

FRONT VIEW OF
NEAR-HOCK FREE FROM
SPAVIN.

FRONT VIEW OF
OFF-HOCK SUFFERING
FROM SPAVIN.



... .. ite of Spavin

certain to be present. For detecting the bony formation, a careful comparison of both hocks by the eye is the safest guide, when, if they are found to be exactly similar and no trace of lameness present, the horse may be passed as all right. Two views of the hock should be taken, one from behind, the other from the side of the corresponding fore-leg. From the latter position the examiner, as advised by Mr. Percivall, should view each hock in turn to see if there be the slightest difference between the two, or prominence on the site of spavin of either. "Now it is precisely the interval between the prominence of the hock ceasing and the cannon beginning—the part of the superficial line which constitutes the *dip* from one into the other—that is *the site of spavin*; a small round tumour interrupts the natural declivity from the hock to the cannon, and in a moment catches the eye of the experienced observer. In cases where the tumour, from its smallness or flatness, or diffuse character, is indistinct to the eye, the examiner will not make his mind up concerning it until he has narrowly compared the suspected with the sound or normal hock" (Percivall). See Fig. 9.

It may not be out of place to notice here a symptom of incurable lameness of the hock joint owing to rheumatic disease, namely, a crackling sound emitted by the joint and accompanied by pain "the moment the patient commences to move about, particularly in the morning, after the repose of the night" (Williams).

When a horse is chronically lame from spavin, the muscles of the affected limb tend to waste away considerably from inaction. In severe lameness of the hind extremities, the animal evinces great disinclination to lie down, and his condition suffers accordingly.

Treatment.—In the very early stages of this lameness, with or without heat and swelling at the site of the spavin, we should endeavour to subdue the inflammation before any structural change takes place; the best means being the employment of a high-heeled shoe to throw the part into rest, the administration of a dose of physic (aloës), the application of hot fomentations, and rest. If there be much pain, keep the part smeared over, during the intervals between the fomentations, with the following anodyne mixture:—

Extract of belladonna	-	-	-	2 parts,
Camphor	-	-	-	1 part.

Gum sufficient to make it adhere.

If after the acute symptoms have subsided, we find the true hock joint to be involved, we may regard the case as hopeless; but if the cannon and cushion bones only be implicated, we may look to the removal of the lameness (when the inflammation has ceased) with the completion of the ankylosis, or union of the affected bones. Our object, therefore, should be to encourage this process by using setons, blisters, or firing; not regarding them as counter-irritants, according to the old and mistaken idea, but as agents for still further increasing the already existing inflammation, in order to hasten the process of union. These irritants excite an increased supply of blood to the part to furnish materials for the new formation of bone that is going on. It is good practice, in the early stages after rest, physic, and hot fomentations have failed, to pass a seton under the skin in a vertical direction, entering a couple of inches above the prominence, and coming out an inch or so below it.

The incision through the skin may be made with a rowelling scissors. A blunt pointed seton needle should be employed.

Some blistering ointment may be smeared over the tape before introducing it. The horse need not be cast; a twitch, and holding up the corresponding fore-leg being all that is usually needed. The part may after that be blistered with the fly ointment. If the muscles of the quarter of that side be at all wasted, they also may be blistered, but lest strangury might supervene, the surface blistered should be limited, say to the size of one's hand. Give the horse a mild dose of physic and keep him on laxative diet. The seton should not be allowed to remain longer in than ten days or a fortnight, so that a blemish be not caused. After this the animal should be kept quiet in a loose box for a month, or until all inflammatory symptoms have subsided. If this treatment does not succeed, fire the part deeply. The method I would prefer is to fire deeply through the skin down on to the deposit at three or four different points, as the case may require, with a blunt iron rod about an eighth of an inch in diameter, heated to redness. This is most effectual, and will leave little or no blemish. Or the part may be fired deeply in the usual manner by drawing horizontal lines about half an inch apart. Firing with the ordinary iron for spavin should, if possible, be done to the horse standing, as then the lines can be drawn straighter than when he is on the ground. They should on no account extend to the front of the joint.

A high-heeled shoe is indicated in spavin lameness.

CHAPTER V.

WOUNDS.

WOUNDS IN GENERAL—OVERREACHES—BRUSHING—SPEEDY CUTTING—
BROKEN KNEES—PUNCTURES FROM THORNS, ETC.—WARBLES AND
SITFASTS—SADDLE AND HARNESS GALLS—INFLAMED AND FISTU-
LOUS WITHERS—POLL EVIL—BURNS AND SCALDS.

Wounds in General.

WOUNDS may be divided into—1, clean cuts; 2, punctures; 3, lacerated wounds, as broken knees, for instance; 4, bruises. We may have one or more of these varieties occurring from a single injury. There are five methods by which wounds may be repaired, viz.—1. By immediate union. Here, the parts being brought into exact apposition, unite in a few hours without any intervening material being deposited between them, hence there is no scar. The absence of all inflammation is a necessary condition for the accomplishment of this process. 2. By primary adhesion. In this there is a certain amount of inflammation in the part that causes an exudation to be thrown out on the cut surfaces, which serves to glue them together in a few days. This exudation, afterwards becoming organized, leaves a white cicatrix. 3. By granulation. This is a tedious process, which is almost invariably accompanied by the formation of matter. 4. By the

union of granulations ; a process that we see when union occurs on the sides of a gaping wound being brought together after suppuration has set in. 5. By healing under a scab. This is the natural method of repair.

It is obvious that our treatment should be directed to obtain repair by either the first, second, or fifth methods, in preference to the other two. Repair by the first can only occur when the cut surfaces are very limited in extent.

We may have repair of a wound taking place by one or more of these methods at the same time.

General Treatment of Wounds.

Stop the bleeding.—There is rarely much difficulty in accomplishing this if the hæmorrhage be from wounded veins only ; cold water or some styptic, such as—

Tincture of the terchloride of iron -	1 part,
Water - - - - -	8 parts,

being generally sufficient. We may know that an artery is divided by the bright red colour of the blood, and by its spurting out. In this case we should endeavour to pick up the end of the artery nearest to the heart with the forceps or tenaculum (an instrument made for the purpose), and tie it with thread. Failing these means we may stop the bleeding by a touch of the red-hot iron. When an artery is partially divided the blood will spurt out in a jet ; in this case, if we are not able to ligature or to sear the vessel, it is advisable to

cut it clean across, when the hæmorrhage will probably cease, owing to the retraction of the ends of the artery within its sheath. Pressure also may be employed, especially if the wound be on one of the legs, when a tourniquet may be improvised by placing a round smooth stone just above the wound, and as near as possible on the course of the artery, while a pocket handkerchief, bandage, or other cloth should be passed round the limb over the stone and loosely knotted. A stick should then be placed between the skin and the cloth at any convenient part, and twisted gradually round, so as to cause the stone to press on the artery. Our next step will be to—

Remove all dirt, clots of blood, and other foreign matters.—We may do this by allowing lukewarm water to flow over the part by means of a sponge. We should avoid touching the wound itself.

If the injury be very superficial without the parts being bruised, we may allow the blood to remain on so as to form a natural scab.

We should next—

Bring the edges of the wound together.—"If the muscular fibres be deeply divided, it is as well to allow the wound to remain open from six to eight hours; or if we employ sutures we should leave them loose, so that they can be easily tied afterwards. At all events, we leave the wound so far open that the blood and serous discharge may escape; and after a few hours we may wash out any clots, bring the edges accurately together, and so secure them" (Spence). The only object of bringing the edges together without delay is to obtain immediate union, a process that will not take

place if the wound be extensive, owing to the consequent inflammation. If we close the wound too quickly we will not allow of the escape of the clotted blood, &c.

The edges of a superficial wound may be kept in contact by means of collodion, a solution of shellac in spirits, or by styptic colloid. Strips of adhesive plaster will serve the purpose in many cases. They may be made from cotton cloth covered with glue, or with one of the adhesive materials just mentioned. The hair should be shaved off.

Sutures.—If possible their use should be dispensed with, as they are apt to leave a blemish, and do not appear to be very successful in veterinary practice, a fact that is probably owing to the difficulty experienced in keeping our patients at rest. Wire of different sizes, made for the purpose, forms the best general suture. The two kinds usually employed are the *interrupted* and the *twisted* suture. Each stitch of the former is complete in itself, while the latter consists of a curved pin that is kept in position by thread wound between the two free ends in a figure of 8.

In making the stitches, the edges of the wound should be brought together, and the wire or pin, as the case may be, should, with the aid of a pin director, be passed through one side and out at the other. The sutures should be about half an inch from each edge, and should go pretty deeply, so as to obtain sufficient hold.

“ Another similar stitch is to be made at the distance of about an inch from the first, and so on until the whole extent of the wound is in this way prepared for confinement by so many distinct and separate stitches ;

its sides or lips being all the time held together by an assistant. The general rule is to tie the middle stitches first; this, however, is of no great matter. The chief precaution required is that they be introduced at correspondent opposite points, so that, when they come to be drawn tight, they meet each other in straight or parallel lines, and confine the sides of the wound evenly and uniformly together, without wrinkling the skin or giving the parts any harsh or unnatural constraint" (Percivall). Bandages may be of use in preserving the position of the parts, but their employment often causes unhealthy action of the wound with the formation of proud flesh, which is simply a swelled condition of the tissues from inflammation. "For the first six or eight hours cold dressings; as lint dipped in iced water, may be used; but this must not be applied too long, as it may do harm" (Spence). The sutures should be removed after four or five days. If the wound inflames, whether from the sutures, plasters, or bandages, these appliances should be removed and the part should be bathed from time to time with some astringent, such as the white lotion, alum and water, or carbolic acid 2 drachms, water 1 pint. But if inflammation does not ensue, the wound should not be interfered with by fomentations, or by lotions of any sort.

The free escape of matter should always be provided for. This is particularly necessary in deep and punctured wounds. No oils, ointments, or other greasy applications should be used near the part, as their employment tends to cause suppuration, which necessitates repair by means of the tedious process of granulation. The use of caustics, also, should be dispensed with as

much as possible, for the swollen tissues will contract on the subsidence of the inflammation, which may become aggravated by the irritation caused by the caustic. Wounds that take on an unhealthy action may, often, be stimulated with advantage by blistering the skin round them.

As a general rule poultices and continued fomentations should not be applied to wounds, unless we desire to hasten the formation of matter, as they tend to destroy the vitality of the part and prevent repair by the first two methods.

If a scab that has already formed be wounded, it should be removed by poultices or by fomentations to allow of the escape of matter. But if a wound is healing under a scab in a healthy manner, it should on no account be interfered with, as this is the natural method of repair.

Superficial *abrasions* are best treated with cold water, and then with one of the applications recommended for “saddle and harness galls.”

In the early stages of *bruises* we may often by the aid of cold applications cause absorption of the exudate, and thus arrest the formation of matter; but if supuration has already set in, we must hasten its progress as much as possible by poultices and hot fomentations.

Punctured wounds are the most dangerous variety; if they be at all deep they will heal only by granulation—hence the free escape of matter should be provided for by opening out the wound if necessary. Employ warm fomentations, in order to reduce the inflammation.

If the injury be accompanied by sympathetic fever,

or if the horse be in a gross condition, he should be put on bran meshes, and should get a dose of physic. But if he is in a debilitated state, his strength should be kept up by liberal feeding and tonics.

Astringent Lotions for Wounds.—White lotion; carbolic acid 2 drs., water 1 pint; solution of alum in water; sulphate of zinc 2 drs., water 1 pint.

Overreaches

Are wounds made usually by the inner edge of a hind shoe striking the fore foot or leg. The injury is generally inflicted just above the heels, though it not unfrequently occurs above the fetlock on the back tendons.

This accident is liable to happen when the horse is allowed to gallop uncollectedly through heavy ground, or when landing over a fence on to deep soil.

Preventive Measures.—When riding the horse “keep hold of his head” and do not allow him to “sprawl about.” Get the inner edges of the hind shoes at the toes on the ground surface bevelled off. Have the hind toes made “square” by setting the hind shoes back from the toes, and allow them to be kept in position by side clips. These precautions in shoeing are particularly necessary for steeplechasers and hunters.

To guard against this injury I have seen a celebrated trotting mare wearing circular india-rubber guards, which were made to draw on over the foot, and to hang down so as to cover the bulbous heels.

Treatment.—Our chief object in ordinary cases is to

prevent moisture from getting to the wound, which is on a part whose substance is so akin to horn that the presence of water would tend to cause decomposition of its tissue. Hence remove any jagged ends that may be present, as the fluid resulting from their decomposition would irritate the wound; and apply tincture of myrrh or tincture of arnica. The alcohol on evaporating will leave a resinous covering which will exclude damp; it also stimulates and dries up the cut. If neither tincture be at hand, use a little ordinary spirits. Keep the feet dry.

If the heels be much bruised, the part should be poulticed and then dressed with the white lotion, or it may be dried by dusting burnt alum over it.

When the overreach is on the back tendons, it may have been made by the inner edge of the hind shoe, or by the point of the toe, as I have seen in the case of a steeplechase horse. When a wound is of this nature the part should be put into a state of rest by means of a high-heeled shoe, and the horse might get a dose of physic, and be kept on laxative diet. Keep the part continually bathed with carbolic acid 2 drachms, water 1 pint; alum and water, or with white lotion, in order to subdue the inflammation. Even when the skin alone is divided, I cannot advise the use of sutures, for the tendon itself can by no possibility have escaped being bruised, although no division of its fibres may be apparent.

Brushing

Is caused by the outer edge of the inner side of a shoe, or sometimes by the rough clenches of its nails, wounding the fetlock of the opposite leg.

It may be due to weakness, when, with increased strength, the habit frequently leaves the animal; to fatigue; to defective conformation, especially when the horse "turns out his toes;" to the fact of the outer quarter of the foot being higher than the inner, an arrangement which will cause the fetlock joint to be inclined inwards, &c.

Preventive Measures.—Lowering the crust of the outside quarter of the foot which gets hit, or thickening the inside half of its shoe, will generally serve to remove the fetlock out of the line in which the offending foot moves. The part of the shoe, which inflicts the injury should be eased off with the file. Strange to say, lowering the inside quarter of the crust of the foot struck, sometimes succeeds in preventing brushing and also speedy cutting; perhaps such cases are those of horses that "turn their toes in." On no account, as is sometimes the practice, should the wall of the crust of the foot, which inflicts the wound, be thinned by rasping, as doing so will weaken a part which is intended by nature to bear weight. Keeping the toes short, or thickening the heels, so as to make the foot more upright—the angle of the profile of the foot should be about 50° —will sometimes prevent brushing; with this object in view the horse may have to be shod, or his shoes removed, once every three weeks.

Horses will hardly ever brush if shod *à la* Charlier.

If the measures which I have detailed do not succeed, a boot or thick india-rubber ring should be worn. An ingenious guard may be made with a flannel bandage about a foot broad, with which a few turns are taken round the fetlock and leg, care being observed to keep all the turns at the same level; a piece of tape is now tied round the leg just above the fetlock and at the centre of the bandage, the upper part of which is then turned over the lower half, so as to form an efficient boot. This should only be a temporary measure, as the pressure of the tape, if continued, will be apt to leave a mark on the hair. This bandage is in common use.

Treatment.—If the wound be inflicted on a previous “brush,” the part should be poulticed until the scab comes off, and then treated by the application of an astringent lotion. The same course should be observed when there is much inflammation present.

Speedy Cutting

Is the act done by the horse when he wounds the inside of one fore-leg near the knee by the other fore-foot.

The seat of the injury is generally a little below the knee, although it may be just above it on the internal lateral prominence of the lower extremity of the bone of the fore arm, the radius. These lateral processes are very prominent in high-bred horses. Their office is to afford attachment to the lateral ligaments of the knee joint. Speedy cutting is essentially an injury peculiar to well-bred horses

with high action. The wound is usually inflicted at the gallop, or when the horse is dancing about from restiveness. I have observed that horses which turn their toes out are very prone to speedy cutting as well as to brushing (see remarks under that heading). Horses generally do not speedy cut until they begin to tire in the gallop.

Before purchasing a horse which one may require for fast work, one should examine his legs to see if there be the marks of old speedy cuts, and also whether there be any signs—as, for instance, the hair being rubbed—of the animal having worn a speedy cutting boot. A deposit of more or less extent will often be found on and around the spot at which a previous speedy cut has occurred.

The preventive measures are of a similar nature for speedy cutting as they are for brushing. Here, too, the Charlier system of shoeing seems to act equally well. Sometimes, removing the shoes and adjusting the “bearing” surface every three weeks will prevent this injury.

Young horses that speedy cut may subsequently abandon the habit as they grow older and stronger.

Symptoms.—Heat, swelling, with more or less fever and pain. In two or three days an abscess may appear, or the part may be wounded rather than bruised, and matter (pus) be formed.

Treatment.—If pus be present, a free vent should be given to it, the part should be fomented and afterwards treated with some astringent, as the white lotion. In any case give at first a purgative, keep the animal on laxative food (unless he be in a debilitated state), and

foment the part with warm water repeatedly. If after some days, when all heat and inflammation have ceased, we find that the swelling feels like a sac—containing fluid—in other words, if it becomes changed into a serous abscess, we should open it by a horizontal incision at its lowest point, so as to allow the hair to grow over the subsequent scar, then apply cold applications, and bandages moderately tight to induce absorption by pressure. Sometimes, even after the abscess is opened, it becomes hard, which it often does when left alone. In fact, the exudation becomes organized. To cause the breaking up of this deposit, we may determine an increased supply of blood to the part by repeated blisters with the biniodide of mercury. A seton is not admissible, as it is liable to thicken the skin and thus leave a blemish.

Broken Knees

Is the term applied to any wound inflicted on a horse's knee or knees by falling, or by hitting himself. On examining the front aspect of the knee of the horse, which part corresponds to the human wrist, we find that it is composed of two rows of bones, three in each row, and that they are so arranged that there are three distinct joints, viz., one between the radius or bone of the fore arm and the upper row; a second between the latter and the lower row, which forms a third joint with the heads of the cannon and splint bones. There is most motion in the upper joint, while the last named possesses the least movement; on this account in a case

of broken knees the injury usually is inflicted on the upper joint, seldom on the middle, and very rarely on the lower one. Besides the six bones I have mentioned there is a seventh bone, the trapezium, placed at the back of the upper row of bones to serve as a lever-like attachment for the tendons of the muscles which flex the knee; occasionally we meet with an eighth and very small bone—the pisiform—at the back of the lower row.

Over the front of the knee passes the broad, flat tendon of the muscle (extensor metacarpi magnus), which extends it; while between this tendon and the bones of the knee, in order to prevent friction, are placed two bursæ or sacs, containing synovia (commonly called joint oil). On the outside front, if I may use the term, passes the tendon of the muscle (extensor pedis), which, as its name implies, serves to extend the foot. And finally the skin, with its subcutaneous cellular tissue, covers the knee.

At first glance we might suppose that from an accident, the tendon in front of the knee might be laid bare without injury to its underlying bursæ, but such is rarely if ever the case, for when pressed upon, the sacs bulge out at each side of the tendon, and get perforated in the event of the tendon becoming exposed by an accident. The tendon of the extensor pedis, except in extremely grave cases, is, on account of its side position, hardly ever laid bare or injured. Now as there are two modes of treatment, applicable according to the gravity of the injury, for broken knees, it may suffice for all practical purposes, to classify these accidents under two corresponding heads: 1st. When

the skin only is bruised or cut, without the tendon being exposed; 2nd. When the tendon is exposed. In the latter case we have an escape of synovia, and the injury may be further complicated by the bruising or division of the tendon, both of which accidents will occasion "open joint;" while we may even have one or more of the bones of the knee fractured.

Treatment.—In a case coming under the first heading, our efforts should be directed to prevent sloughing, a process which will surely occasion blemish, with a consequent depreciation of the animal's market value when he is cured. Having this object in view, we should, after gently fomenting the wound for a quarter of an hour or so in order to remove dirt and grit, put the horse on the pillar reins so that he may not injure the part by bending the knee when attempting to lie down, or by scratching it; while a physic ball and laxative food will serve to allay fever, and promote the excretion of effete materials from the blood. The part itself should be bathed, four or five times a day, with some astringent application, nothing being better than a saturated solution of alum. It may be thus used:—dissolve a pound to a pound and a half of alum in a bucket of cold water, into which dip a sponge and gently press it against the leg above the knee, continuing the process for five or six minutes. In this way the vitality of the part will be preserved, and inflammation controlled. Instead of the alum solution, a wash composed of three drachms of carbolic acid to the quart of water may be used.

We must regard inflammation as the natural process by which blood is determined to an injured part, in order to furnish materials for its repair. In fact, it is a

process of growth, which the too long continued application of cold and astringents, by cutting off the supply of blood, may check to such an extent that repair may not take place in the injured part. All that we require is to prevent, as much as possible, the inflammation proceeding to the suppurative stage—the one in which pus (matter) is formed.

This bathing of the part should be continued for some days, according as the nature of the injury demands. While tied up, the horse should have a rug or piece of sacking suspended about the level of his chest, to hold his hay.

If the animal has to be kept tied up for a long time, slings should be employed, and on no account should he get his freedom until there be not the slightest probability of the skin cracking in the event of his bending the leg. This is a most important point to be attended to.

“Very often a small piece of dead tissue will be seen, presenting a deadened, white appearance in the wound. This should be removed by the curved scissors, otherwise it will act as a foreign body” (Williams).

The treatment of a case in which the tendon is exposed, or in which there is “open joint,” is as simple as that which we have just described. The white appearance of the exposed tendon and the flow of synovia will readily show the nature of the injury. No time should be lost in putting the horse in slings if possible, and in rubbing in a strong cantharides blistering ointment below and on both sides of the wound and to the rear of the knee, so that all movement in the part may be arrested.

The blistering ointment should not be rubbed on the skin above the wound, for then it might "run" into it, and thus cause considerable irritation. "The blister acts by removing pain, limiting motion, exciting the formation of healthy granulations, and (as a result of the swelling it produces) causing the approximation of the surfaces of the wound" (Williams). The lacerated parts should on no account be interfered with further than what is sufficient to clean them of dirt and grit; but the synovia and other discharges should be allowed to accumulate, so that on drying they may prevent admission of air to the wound.

While in Edinburgh I saw a case treated successfully as above, in which dried synovia—the accumulation of several weeks—extended from the injured knee to the hoof, resembling somewhat an icicle in appearance.

If the fever be very high, as will be indicated by a quick and hard pulse, 10 drops of Fleming's tincture of aconite may be given in a pint of water; this may be repeated—diminishing the aconite to 6 or 7 drops—once or twice.

As soon as the effect of the blister has begun to subside, another application should be rubbed in. In this the practitioner must exercise his own judgment.

If the tendon gets crushed instead of being cut, the crushed part will slough out after four or five days and leave the joint exposed. Whether this occurs by sloughing, or by laceration of the tendon, there is great danger to the life of the patient, and even if he recovers he will have a permanently stiff knee joint. If the injury be complicated by fracture of one or more bones

of the knee, recovery may be regarded as nearly hopeless.

After the fever has passed off, the horse's strength should be kept up by ~~fairly~~ liberal feeding.

It sometimes happens that in a case of broken knees, the skin of the lower edge of the wound has been rumpled back by the horse sliding forward on his knees when on the ground at the time of the accident, and a sac has been thus formed into which dirt has entered. In this case the sac should be probed, and at its lowest point a horizontal orifice, so that the subsequent cicatrix may be concealed by the hair, should be made with the knife to allow of the dirt, &c., working out. Occasionally this sac is not apparent for some days; it will then be found soft to the touch, and full of matter when it is opened—as it should be—at its most dependent part. The little finger will often serve the purpose better than the probe. It being often as important to know what not to do, as what to do, I will endeavour to impress on my readers that on no account should the edges of the wound be brought together by stitches, for as soon as the horse bends his knee, he will tear the stitches out, and thus leave a serious blemish. The wound should not be poulticed nor fomented for any continued time, for either proceeding will tend to destroy the vitality of the part. The wound should not be probed except when a sac is formed—and then the instrument should be kept well away from the joint—because in doing so there is the greatest danger of seriously increasing the injury, owing to the tendon and joint being so very close to the surface. Bandages should not be applied to the part, as their use occasions

congestion of the blood-vessels and consequent diminution of material brought by them for repair of the wounded surfaces. At first there is often the appearance of a good deal of so-called proud flesh. This, as pointed out by Professor Williams, is simply due to the swollen condition of the wounded tissue, which condition will abate of its own accord as the inflammation subsides; on this account we should carefully avoid irritating the inflamed parts by the application of caustics, which should be reserved to stimulate the part, if necessary, to healthy action after the inflammation has subsided. In this case we may use the nitrate of silver.

Punctures from Thorns, &c.,

Are most common about the fetlock, knee, and forearm. When inflicted on the latter, they are apt to give rise to serious consequences, owing to the probability of matter on forming burrowing down towards the knee, by reason of the tendinous nature of the muscles of the part. If a thorn deeply penetrates the skin close to a joint, it is advisable, when it cannot be removed without cutting down upon it, to shave the hair and to blister the spot. This, by preventing motion, will obviate the possibility of the thorn working further in, and will generally cause it to readily slough out. Much harm is often done by searching for thorns, &c., with the knife. All the treatment that is usually necessary is to apply warm fomentations and poultices, and, when matter forms, to give it vent with the knife. Capped knee and capped fetlock are sometimes caused by thorns penetrating the synovial bursæ of these joints.

Warbles and Sitfasts.

Warbles are tumours that form on the skin, from irritation due to the pressure of the saddle or collar. They are induced by a heated state of the system, and by irregular work.

With riding horses the usual spot for a warble to appear is just behind the cantle of the saddle, the general cause being that the saddle, which inflicts the injury, is too short for the rider. When this is the case, the weight is thrown on the cantle, and if the horse be made to go fast or to jump, the skin immediately behind the cantle being pressed downwards and backwards, becomes forcibly wrinkled at each stride the animal takes, the natural result being that inflammation takes place and a tumour appears; a repetition or two of this process increases the evil: matter is formed, the warble suppurates, and the horse is laid up for a month or more. I have seen so many cases of sitfasts having been produced by saddles that were not long enough for their riders, even after they had been stuffed and re-stuffed, that I am confident I am correct in laying the blame in nine cases out of ten to shortness of the tree. The length of the saddle should principally depend on the length of thigh of the horseman.

If a horse be thoroughly and quickly dried underneath the saddle on returning from work, no evil will result from the gear having been removed while the animal was still warm; but if the rubbing down be neglected, a crop of warbles will be the probable result.

• Cold water and rest will generally be sufficient to reduce a warble when taken in time. If it continues

hot and inflamed, warm fomentations and poultices should be applied ; on matter being formed, the abscess should be opened with a knife, and then treated as an ordinary wound. If the tumour continues indolent, stimulate it with the biniodide of mercury ointment.

Neglected suppurating warbles are apt to take on an angry, unhealthy-looking appearance, having a hard, leathery margin round their circumference ; they are then called *sitfasts*. This hard, dead skin that surrounds the sore, being a foreign body, must be removed, which may be done by continued poultices. If this treatment does not succeed, cast the horse and remove every particle of the hard cuticle with the knife, and treat the sore with an astringent lotion, like an ordinary wound.

Saddle and Harness Galls.

In ordinary saddle work the girths often cut a horse, from the person saddling the animal neglecting, on girthing up, to pass his finger between the girth and the skin, so as to prevent the latter from being wrinkled. Girths of raw hide or of cord, which allow of ventilation, are often useful for avoiding galls. The Fitzwilliam, which consists of a broad girth attached to two buckles at each side with a narrow one over it, is, I have found, the girth which is least liable to gall a horse. If the skin is very tender, a piece of lambskin may with advantage be sewed round the girth, with the wool towards the sensitive part.

Salt and water, or alum and water rubbed into the

shoulders will often help to harden them for harness work.

The stuffing and lining of saddles and collars should be attended to. If a saddle-cloth be not used, the pannel will become hard from the absorption of perspiration. Leather saddle-cloths are excellent for preventing sore backs. If constantly used they do not require any dressing, for the oily matter of the sweat will keep them soft and pliable. The leather should be made somewhat larger than the pannel.

Treatment.—Any of the following may be used :—

1. Tincture of myrrh and aloes.

This will prevent flies coming near the part. It also protects it by means of a resinous coating left when the spirit evaporates.

2. Strong solution of common salt,

Tincture of myrrh (Prof. Dick).

3. Styptic colloid.

4. Turpentine $\frac{1}{2}$ oz.,

Vinegar 1 oz.

Mix well with the whites of four eggs and shake up so as to form an emulsion (General Ryves).

5. Alum and water.

6. Salt and water.

7. Water.

While the horse's back continues sore, I need hardly say that he should not be worked.

Whenever a scab becomes bruised or hurt it should be poulticed until it falls off, so as to give free vent to any new matter that may form ; after that, the wound should be treated with an astringent lotion or with cold water.

Inflamed and Fistulous Withers.

Saddles usually gall horses on the withers, by having too little stuffing in the pannel under the pommel; by the arch of the gullet-plate being too broad; or by the points of the tree being too far apart. Saddles with the pommel cut back are, I think, more liable to gall a horse than are those with it cut straight down.

Horses with naturally high withers are very liable to get them wrung by ill-fitting saddles. If it be inconvenient to have the pannel properly stuffed a pad may be made as follows:—Take six or eight pieces of felt, each being about four inches broad and six or seven inches long. Arrange them so as to form two pads of equal thickness, about four inches apart, on a piece of serge thirteen or fourteen inches broad and seven or eight inches long; over the whole place a similar piece of serge, and sew them together so as to form one pad, the centre and thin part of which will lie over the withers, while the padded sides will raise up the pommel. This form of pad is very useful with racing saddles. A folded handkerchief or towel placed on the withers is of little use, for it simply prevents them being cut by the iron gullet-plate, but does not relieve them from pressure.

When saddle-cloths or *numdahs* are used, the groom, before girthing up the horse, should with his finger raise the cloth well up into the gullet, so that it may not press tightly down on the withers.

Treatment.—If the bruise be but slight, cold applications may be sufficient to reduce the inflammation and swelling. But, if this desirable result be not ob-

tained, blister the part with the biniodide of mercury ointment, in order to prevent the matter from burrowing down so as to cause fistulous withers. Free vent should be given to the pus, and the part may be treated with warm fomentations at first, and after that with an astringent lotion.

If matter has already formed, the tumour should be freely opened with the knife and treated as before described; or a seton, smeared with the biniodide of mercury ointment, may be passed through the lowest point of the sinus.

When, from neglect, the walls of the fistula have become callous, the following application, injected, or applied on cotton wool, may be tried with advantage:—

Corrosive sublimate	-	-	$\frac{1}{4}$ ounce,
Hydrochloric acid	-	-	5 drops,
Rectified spirits of wine	-	-	2 oz. (Gamgee).

If the bones of the vertebræ become involved, they should then be cut down upon, and the dead or diseased portion should be removed.

In all cases, if possible, an opening should be made at the lowest point of the sinus for the escape of matter.

Blisters applied around the sinus are particularly useful for stimulating the part to healthy action.

Give a dose of physic, and keep the animal on laxative food.

Care should be taken that the animal is not allowed to rub his sore withers against any part of his stall.

Poll Evil

Is similar in its nature to fistulous withers. It consists of an abscess or abscesses which form immediately behind the ears of the horse, as the result of blows, or, according to Professor Williams, from the continued use of a tight bearing-rein. Mr. Percivall, very correctly, I think, states that it is often caused by the cart-horse rubbing his poll against any convenient object, when suffering from irritation due to the wearing of hard, heavy, and ill-fitting head-collars.

Treatment.—If matter has not formed, blister the part; but if the abscess be ripe, open it and treat as for fistulous withers.

Burns and Scalds.

Treatment.—Apply carron oil, which is made by mixing equal quantities of linseed oil and lime-water; or keep a coating of flour on the part. Give frequent stimulants, such as a quart of ale, or a couple of glasses of spirits in a pint of water. Keep the animal on laxative food.

CHAPTER VI.

SYNOVIAL ENLARGEMENTS.

WINDGALLS—BOG SPAVIN—THOROUGHPIN—CAPPED KNEE.

IN order to diminish friction between certain structures, closed membranous sacs, containing an oily fluid called *synovia*, or (vulgarly) joint oil, are placed between them. *As work causes an increased secretion of this fluid, we frequently find a chronic distended condition of these sacs from its prolonged continuance, with little or no inflammatory symptoms. Thus we have in bog-spavin an enlargement of the synovial membrane which lines the capsular ligament of the true hock joint. In capped knee we find distension of the synovial bursæ that facilitate the movement of the extensor tendon over the front of the knees, while in thoroughpin there is distension of the synovial sheath which allows the perforans tendon to glide smoothly over the os calcis. These instances afford us examples of the three actions respectively performed by the three classes of synovial membranes, viz., to line the capsular ligaments of joints; to allow one surface to glide over another; and to line a canal or sheath through which a tendon passes.

With the exception of capped knee, which is the result of injuries, these enlargements are, as a rule, signs of work in old horses, and of weakness in young ones.

In the great majority of cases, the superabundant

synovia remains unchanged, and the animal suffers little or no inconvenience from its accumulation. But in some rare instances the fluid becomes organized into fibrous tissue, which is hard and unyielding to the touch. I have seen a case similar to the one mentioned by Mr. Percivall, in which the process of organization in a windgall proceeded still further, so that it gradually became, during old age, converted into bone. I think horses in hot climates are more inclined to develop these enlargements than are those in cold or temperate countries.

As these diseases rarely affect the usefulness of the animal, they should not, as a rule, be interfered with.

General Treatment.—If heat and inflammation be present, apply warm fomentations; put the horse on laxative food, and give a purgative if necessary. When applicable, employ a high-heeled shoe in order to throw the part into a state of rest. After the inflammation has subsided, apply pressure by means of bandages, or by trusses which are made for the reduction of bog spavins and thoroughpins. The continued application of the compound tincture of iodine has been found to be of service in some cases. Blisters and rest may cause absorption for the time being, but the distension will generally appear as bad as ever on the resumption of work.

Windgalls

May be said to be a distended condition of the synovial sacs that exist about the fetlock. They appear in the form of soft, puffy swellings, which may vary in magnitude from the size of a pea to that of a hen's egg, or even larger. The usual positions they occupy are as follows:—1. In the space between the branches of the suspensory ligament and the perforans tendon; this is their usual site. 2. "In the interval between the perforatus and perforans tendons, about two inches above the sesamoid bones; indeed, the sac of the windgall, from surrounding attachments to its borders, appears as though it gave passage to the perforans tendon through its cavity; though this appearance, in point of fact, is owing to the membrane of the bursa being reflected upon the surface of the tendon" (Percivall) (See Fig. 1.) 3. In front of the fetlock under the tendon that extends the foot. 4. As mentioned by Mr. Percivall, in front of the fetlock, but between the extensor tendon and the skin. 5. Between the sesamoid bones and the perforans tendon. In this latter form, as the distended sac cannot, owing to the pressure of the perforans tendon, bulge backwards, it appears as a puffy swelling at both sides of the back of the fetlock, constituting what we may term thoroughpin of that joint. As pointed out by Professor Williams, we find that this enlargement is soft and yielding, we may regard it as of little consequence; but if it feels tense, although it may fluctuate on pressure, we may deem its presence to be owing to inflammation of this synovial sac; a condition which constitutes a most

intractable disease (sesamoiditis), and which causes a most grave unsoundness whether the horse goes lame or not, for although the lameness may disappear with rest, it will return as soon as the horse is put to work again.

Treatment.—Although windgalls are of little consequence, still, to prevent their further development, we may with advantage try the effect of the continued application of a wet bandage to the part, with a tight flannel bandage over it, so as to afford pressure. Rest and blisters will remove windgalls, but only for the time being, as they will again appear as soon as the animal recommences work.

Bog Spavin

Is a distended condition of the synovial membrane of the capsular ligament of the true hock joint; it is situated on the inner side of the hock, higher and more forward than the seat of bone spavin, lying between the base of the astragalus and the internal lateral prominence (the malleolus) of the tibia (see Fig. 8). It is soft and elastic, and extends up and down the inner front of the joint for about three or four inches. Thoroughpins usually accompany large bog spavins.

Thoroughpin

Is a distended condition of the synovial sheath of the perforans tendon as it passes over the os calcis. The sac thus formed is pushed up into the space between the perforans tendon and the tendo-Achillis, a name given

to the two tendons which pass down to the point of the hock (see Fig. 3). If it be pressed with the finger on one side of the limb, it will appear with increased prominence on the other side ; hence the name.

Capped Knee

Is a distended condition of one or both of the synovial bursæ of the tendon (extensor metacarpi magnus) which passes over the front of the knee. It is usually caused by blows, and, as observed by Professor Williams, may ensue from the entrance of thorns.

Treatment.—If warm fomentations and subsequent blisterings have failed, we may puncture the bursa by making a horizontal incision at its lowest point, and should then apply a firm bandage over it so as to cause adhesion of its walls. “ The puncture in the skin must be kept open (and the best plan to do this is to insert a small piece of lint or tow into its orifice, allowing it to remain in for a few hours), in order to allow the escape of any fluid which might collect in the sac. The bandage is placed so as not to cover the wound. There is no danger to be apprehended from opening this bursa ” (Williams).

CHAPTER VII.

SEROUS ABSCESSSES.

CAPPED HOCK—CAPPED ELBOW.

SERUM, which is the fluid we find on opening a blister, often accumulates at the point of the hock, or at the back of the elbow, causing these parts to become "capped," as a result of injury. Unlike synovia, the serum contained in these tumours generally becomes quickly organized into a low form of fibrous tissue.

These enlargements, though unsightly, rarely cause uneasiness to the horse; however, they may be treated boldly by surgical means, as they are well removed from any important structures.

Capped Hock

Is situated at the point of the hock, between the cap of the perforatus tendon and the skin (see Fig. 3); it is usually caused by kicking. It is not an unsoundness.

Treatment.—When the injury is recent, warm fomentations should be applied to the part. If an attempt is to be made to reduce the tumour, which should not be done until all heat and inflammation have subsided; a seton, which should be allowed to remain in not longer than ten days or a fortnight, may then be passed through

its centre; or the part may be stimulated from time to time with the biniodide of mercury ointment (1 to 30 of lard).

Capped Elbow

Is situated behind the elbow joint, and is caused by the part being hurt by the heels of the shoe pressing upon it when the horse lies down.

It rarely causes lameness.

We may generally arrest the development of the tumour if we treat it properly in its earliest stage. With this object in view, remove the shoe, or cause the horse to be shod with short heels, and at night cover the heels with some soft material such as felt, so that they may not hurt the elbow; or tie the horse up. Use continued fomentations of warm water for a few days, and after that rub in the following liniment--

Soap liniment	-	-	-	-	$\frac{1}{4}$ pint,
Strong liquor ammoniæ	-	-	-	-	$\frac{1}{2}$ drachm,

for a considerable time every day for a fortnight or so. The pressure and stimulating effect of the liniment will generally cause the tumour to disappear.

If the abscess does not yield to these simple means, we may pass a seton through its centre in a vertical direction, and allow it to remain in for not longer than ten days or a fortnight. If it is already hard and fibrous, we may safely remove it with the knife. To accomplish this make a long vertical incision through the skin, and then carefully dissect the tumour out. The application of cold water and any astringent lotion will constitute all the after treatment required.

CHAPTER VIII.

DISEASES OF THE EYE.

SIMPLE OPHTHALMIA—PERIODIC OPHTHALMIA OR MOONBLINDNESS—
WORM IN THE EYE—AMAUROSIS OR GLASS EYE.

Sketch of the Anatomy of the Eye.—The surface of the eye and the inside of the eyelids are covered by the *conjunctiva*, a delicate mucous membrane.

The wall of the eyeball at its anterior part is formed of a strong transparent covering called the *cornea*, which is somewhat of the form of a small watch-glass, while the remainder consists of a strong fibrous coat, the *sclerotica*, which is lined by a dark membrane, the *choroid*. Behind the cornea, and attached to the choroid, hangs a thin contractile curtain termed the *iris*, through the centre of which there is an elliptical opening known as the *pupil of the eye*.

The anterior portion of the sclerotica lies immediately under the so-called *white of the eye*, which is the expansion of the tendons of certain muscles. We may regard the cornea as the continuation of the sclerotica, and the iris as that of the choroid.

“Two sets of fibres enter into the formation of the iris, one of which, converging from the circumference towards the centre, has the power of dilating the pupil; the other, surrounding the margin of the pupil on its posterior surface, and blending into the radiating

fibres, has the power of contracting it" (Strangeways). The distinctive colour of the eye is derived from that of the iris, which "is variously coloured, but in the horse is brown, with more or less of a yellow tinge; sometimes, however, it is almost white or grey, when the animal is said to be 'wall-eyed'" (Strangeways). Behind the iris, which is slightly convex, and suspended from the choroid, is a biconvex, transparent and solid body—the *crystalline lens*—which is compared by Chauveau to a rose diamond. This lens divides the eye into two compartments,—the anterior, which is partially divided by the iris, and filled by a watery fluid called the *aqueous humour*; the posterior, that holds a very similar liquid—the *vitreous humour*.

The optic nerve proceeding from the brain enters the eyeball at its posterior part, and pierces the sclerotica and choroid; it then, by its expansion, forms a membrane, the retina, that lines the choroid, and terminates at the circumference of the crystalline lens. When rays of light, coming from any object, impinge on the eye, they enter through the pupil, and becoming refracted by the crystalline lens, are thrown on the retina, which conveys, through the optic nerve and thence to the brain, a correct impression of the object seen. The choroid is dark-coloured, so as to absorb any superfluous rays, while the pupil has the power of contracting and dilating in order to regulate the admittance of light.

Simple Ophthalmia

Is inflammation of the membrane (the conjunctiva) which covers the surface of the eye, and lines the eyelids. It usually occurs from injuries, or from the presence of a foreign and irritating body. It may accompany catarrh, influenza, &c. It very rarely indeed comes on as a distinct disease of itself, cold then being the usual cause.

Symptoms.—The eye has the appearance of having received a blow. The eyelids are closed and swollen. The eyeball is retracted. Tears flow copiously. The haw projects, and there is great intolerance of light. The conjunctiva is red and congested. The cornea gradually becomes clouded, the opacity appearing to be superficial and of a bluish colour, characteristics which distinguish this inflammation from periodic ophthalmia.

Treatment.—Examine the part to see if there be any external injury; if a foreign body be found in the eye, remove it with caution. To do this we may have to draw back the haw (membrana nictitans) by, as recommended by Professor Williams, transfixing it with a needle and thread. Give a dose of physic and keep the animal on laxative food. Foment the part with warm water and keep the horse in darkness. Smear, from time to time, the skin round the eyelids with the extract of belladonna, which may be made to adhere by mixing it with a little gum. The belladonna relieves the congestion of the blood-vessels by causing their muscular coats to contract. If the eye remains weak, it may be stimulated by the application of—

Sulphate of zinc	-	-	3 grains,
Or alum	-	-	6 „
Or nitrate of silver	-	-	2 „
Water	-	-	1 oz. (Gamgee).

On no account should any salt of lead be used to the eye, as it would be apt to cause opacity of the cornea, by the lead forming a white and insoluble albuminate with the albumen of the part.

Periodic Ophthalmia or Moonblindness.

This is happily now a very rare disease.

It is induced by bad sanitary arrangements; and, according to Mr. Percivall, by the wet marshy pastures on which horses have been reared, and by hereditary predisposition. Formerly, the latter was a frequent cause of blindness among Irish horses. This disease appears to be an inflammation of the whole structure of the eye, while in simple ophthalmia the membrane which covers the eye only is affected. It is generally confined to one optic. The symptoms come on suddenly, and resemble those of simple ophthalmia, except that in the former the interior of the eye becomes changed in colour, and of a dim dull appearance; the cornea also becomes clouded. In the latter, the inflammation is confined to the surface of the eye.

The intensity of the symptoms usually begins to abate after about a week, and gradually the cornea and conjunctiva assume more or less their normal condition. Mr. Gamgee observes that "the first attacks are usually the longest, and their duration

diminishes, as a rule, with their recurrence. During the progress of apparent recovery a relapse is not unfrequent, and the term may be thus indefinitely lengthened. The interval between the attacks is, on an average, about sixty days. The eye may seem quite clear during the intermission ; but it has not returned to its normal condition. The outline of the upper eyelid is usually altered. It presents a slight bend in its internal part, so that the upper joins the lower lid, at the inner angle, by a right in place of an acute angle. This is best marked after several severe attacks, and gives a triangular outline to the opening between the lids."

Professor Williams notes the peculiar wrinkled or furrowed appearance which the upper lid and eyebrow assume.

The eye appears smaller than natural, and looks dull and weak. In confirmed cases the hawk is prominent, the cornea more or less opaque, and the iris changed in colour.

These indications may be of use to an intending purchaser.

This disease usually terminates in cataract, although the latter affection may come on independently of the former.

Worm in the Eye.

This disease is almost peculiar to India, in some districts of which country it is not of unfrequent occurrence. It consists in the appearance of a thin thread-like worm in the aqueous humour of the horse's eye. The para-

site varies from about half to one inch in length. Dr. Cobbold (*Veterinarian*, November, 1874) states that they are of two kinds, viz., the *Filaria papillosa*, the large, and the *Spiroptera lachrymalis*, the small variety. These worms are found in various parts of the body as well as in the eye, and are evidently taken into the circulation by means of the water which the animal drinks.

The first symptom of the presence of the worm is a slight opacity or milkiness of the cornea, due to inflammation; beneath this opacity the worm may be observed moving about. No time should now be lost in operating, for if the worm be left undisturbed, the inflammation of the cornea will proceed, and the animal will probably lose its sight in a short time. The removal of the worm may be effected by puncturing the cornea with a lancet or sharp penknife, the point being guarded by thread wrapped round the blade, leaving about a quarter of an inch of the point bare. The puncture should be made obliquely, and close to where the cornea joins the white of the eye, and on the outer margin; obliquely to avoid wounding the iris, and also to allow of the ready apposition of the edges of the wound; and close to the line of union of the cornea and sclerotica, so that the worm may more readily escape. The outer portion of the cornea is more readily operated upon than the inner. Before making the puncture, the operator should wait till he finds the worm in a position that will facilitate its escape on the fluid squirting out. To aid this, at the time of operating, he might press the upper part of the eyeball with his left hand, and also might

gently tilt up the outer edge of the wound with the lancet before withdrawing it, so as to leave a good aperture for the exit of the parasite. A twitch will generally be sufficient to keep the animal quiet during the operation, which had best be done standing. In difficult cases, chloroform might be employed with advantage.

The subsequent treatment may consist in shading the eye from light and applying cold water; or a mild astringent, such as any one of the applications recommended for simple ophthalmia.

Horses affected with worm in the eye should be liberally fed, and should get tonics, such as a drachm of sulphate of iron, twice a day, in the food, and a couple of quarts of beer a day to drink. Following the teaching of Dr. Neligan, we use these means to correct the peculiar condition of the system (helminthiasis) that promotes the generation of these parasites.

Amaurosis or Glass Eye

Is a condition of the eye in which there is loss of function of the optic nerve, which renders the retina insensible to the action of light. It may be due either to disease of this nerve, or to sympathetic causes: if, owing to the former, it is incurable; if to the latter, it will disappear as the original disease is relieved.

In the great majority of cases both eyes are affected. The presence of the disease may be known by the fact of the pupil remaining dilated and immoveable under the influence of light, while the interior of the eye looks bright, healthy, and somewhat clearer than

natural, in fact, it looks glassy; hence its common name. The eyelids are opened wide; and when both are affected, the animal's action and appearance denote that he is blind.

As remarked by Professor Williams, if one eye only is diseased, its pupil will contract on light falling on the sound eye; but if the blind eye be alone subjected to the influence of light, neither its own pupil nor that of the healthy organ will contract. The influence which the sound eye has on the blind one is owing to the distribution of the optic nerve fibres; there being a nervous connection between the two eyes, as well as between each eye and the opposite nerve root. But that portion of the nerve which proceeds from the blind eye to the brain, having lost its function, is unable to influence the healthy optic.

CHAPTER IX.

DISEASES OF THE ORGANS OF BREATHING.

INFLAMMATION OF THE LUNGS—PLEURISY—BRONCHITIS—CHEST INFLUENZA—CONGESTION OF THE LUNGS—SORE THROAT—CATARRH—SIMPLE COUGH—CHRONIC COUGH—ASTHMA OR BROKEN WIND—ROARING, AND WHISTLING—THICK WIND—HIGH-BLOWING—STRANGLES.

**Inflammation of the Lungs—Pleurisy—
Bronchitis—Chest Influenza.**

Sketch of the Anatomy of the Organs of Breathing.—The nasal passages open into a cavity called the *pharynx*, which also communicates with the mouth through an opening called the *isthmus*, over which the soft palate is suspended as a valvular curtain in order to keep it shut, except during the passage of food or water; hence the horse is unable to breathe through his mouth. The windpipe or *trachea* opens into the pharynx by means of a short cartilaginous tube, the *larynx*, which is the organ of sound. It is situated at the back part of the space between the lower jaw. When it is inflamed we have *laryngitis* or sore throat. The larynx is guarded from the entrance of food, water, &c., by a cartilaginous valve called the *epiglottis*, over which the bolus of food, or “go-down” of water, passes. The windpipe or *trachea* is an elastic tube formed of incomplete cartilaginous rings; it termi-

nates at the base of the heart and splits up into two tubes, the right and left *bronchi*, which respectively go to the right and left lung. These bronchi further subdivide into a great number of branches called the *bronchia* or *bronchial tubes*, which finally open into the air-cells of the lungs. "The entire ramification has the appearance of a tree, the trachea being the main trunk, the bronchi and bronchia the branches, and the air-cells leaves" (Strangeways' Anatomy). The nasal passages, the pharynx, larynx, and bronchial tubes are lined with mucous membrane. Thus in sore throat and bronchitis (inflammation of the bronchial tubes), we have at first a dry and inflamed condition of this mucous membrane, succeeded by an increased secretion of phlegm (mucus).

The lungs are composed of a spongy substance, which is made up of a vast number of small lobules, that are connected together by cellular tissue. Each of these lobules is complete in itself, and is supplied with a small bronchial tube, which conveys air to the minute air-cells. The capillary blood-vessels "are so arranged between the two layers forming the walls of two adjacent cells, as to expose one of their surfaces to each, in order to secure the influence of the air upon them" (Fleming). The blood thus brought into extremely close proximity with the air contained in the cells while traversing their walls, takes up the necessary supply of oxygen for the requirements of the system, and gives off the carbonic acid which it absorbed in its passage to the lungs.

The mucous membrane that lines the bronchial tubes not continued into the air-cells; hence bronchitis

often occurs without the lungs being involved, and pneumonia without the inflammation extending to the bronchial tubes.

The *pleuræ* are two smooth and glistening membranes which line the cavity of the chest and cover the lungs, thus forming two closed sacs; their office being to prevent friction between the lungs and the walls of the chest. They secrete *serum*—the watery fluid contained in a blister—with which to lubricate their inner surfaces. When attacked by inflammation they become dry during the first stage; hence we have the dry crackling friction sound emitted from the cavity of the chest during the early stages of pleurisy (inflammation of the *pleuræ*), the lungs being in a constant state of movement inside the chest. Owing to the *pleuræ* forming closed sacs, we always have, after an attack of pleurisy, a greater or less effusion of serum into them, constituting “water on the chest.”

As the *pleuræ* are most intimately connected with the lungs, we rarely have one structure affected by inflammation without the other also becoming implicated.

The general treatment of these diseases, whether in a simple or combined form, is so similar that there is little to be gained, even if it were practicable, by drawing a hard and fast classification of these ailments. Hence I have included them under one broad heading.

Their usual cause is exposure to cold and chill.

Generally, in these chest complaints, the horse refuses to lie down, the bowels are costive, and the *fæces* are mixed with flakes of mucus, which indicates irritation of the intestines, and the non-administration of aperients, which, if given, would still further add to

the existing irritation, and might induce fatal consequences.

I will briefly describe the respective symptoms of pneumonia, pleurisy, bronchitis, and chest influenza, occurring in a simple form ; then remark on the symptoms presented in complicated cases, and finally give the general treatment, with such special treatment as the symptoms may indicate.

In these chest disorders, an unprofessional observer will often be unable readily to detect the disease in its first stage ; at the outset the horse will usually appear to him to be simply dull and out of sorts ; for this reason the attack will have usually run a part of its course before its existence be suspected.

One should remember that these diseases, in their first or inflammatory stage, run a regular course which terminates in the exudation of lymph, which is the watery and colourless portion of the blood. The inflammatory or fever stage may last about a week, more or less.

Professor Williams remarks respecting inflammation of the lungs, " It will be seen that pneumonia is dangerous during two stages : first, during the early ver, which may destroy life by its intensity ; and secondly, during the period of lung hepatization [consolidation into a substance resembling liver], which may prove fatal by so altering the lung tissue as to produce suffocation."

In pleurisy there is, during the second stage, an exudation of lymph, which becomes more or less organized on the pleuræ, and also an effusion of serum (the pleuræ being serous membranes) into the

cavity of the chest, forming water on the chest, or hydrothorax. In bronchitis the exudation forms inside the bronchial tubes, and often, becoming organized, causes obstruction to the air breathed, as indicated by the animal "making a noise," or by his becoming thick winded; infiltration may also take place into the substance of the lung, causing it to become solidified, with consequent loss of function in the part implicated.

Symptoms of Inflammation of the Lungs.—Dulness and depression of spirits. Fever. Acceleration of pulse, often over 80 per minute (normal pulse about 38). Pulse sometimes hard and bounding, sometimes weak and oppressed. Breathing soon becomes much quickened, being sometimes over 40 per minute (normal rate from 12 to 18). The breathing is without marked pain, unless complicated by pleurisy. If the horse coughs, the cough is full and strong, and very unlike the suppressed painful one of pleurisy. The mucous membranes of the nostrils (the Schneiderian), and that of the eyelids (the conjunctiva) are red and congested. Fine blood-vessels in a red and congested state may be seen on the outer edge of the membrane (the conjunctiva) which covers the white of the eye, giving it a bloodshot appearance. Internal temperature about 104° F. If the ear be applied to the there is no very clearly defined abnormal sound, except that of quickened breathing. If the attack is but slight, the exudation may become absorbed, and the lungs may recover their healthy tone without further change.

If the horse does not succumb during the first stage of the disorder, the fever gradually subsides; the pulse

falls; the temperature of the mouth and body becomes lower; the appetite returns; and the urine, before scanty, is now abundant. The breathing, which had decreased with the abatement of the fever, now increases in rapidity, owing to consolidation of a portion of the lung, thereby leaving a diminished amount of that organ with which to perform the function of breathing.

Symptoms of Pleurisy.—Pleurisy generally attacks only one side of the chest, that being the right in most cases. At first the symptoms generally resemble those of colic, except that the pain is constant and not intermitting. The horse shows a great disinclination to move. There is considerable distress. In mild cases the colicky pains are often absent, and a shivering fit precedes the disease. The affected side is tender to the touch. The breathing is quick, imperfect, and abdominal, so as to obviate movement of the ribs as much as possible. The nostrils are dilated. There is usually a dry short cough present, which is repressed by the animal, so as not to shake the inflamed tissues. Often, during expiration, the horse gives a painful grunt, especially when he is made to move. The pulse is generally hard and quick, or it may be weak and oppressed, and not much quicker than usual. If the ear be applied to the affected side, a dry crackling or friction sound may be heard, as if two dry pieces of bladder were rubbed together: this is owing to the dry and inflamed pleuræ (which line the cavity of the chest and cover the lungs) rubbing together during respiration.

We may say that the three characteristic signs by which pleurisy in its acute stage may be recognised are—

the dry crackling or friction sound heard on applying the ear to the affected side; the short, dry, painful, and suppressed cough; and the abdominal breathing, made evident by the existence of a groove between the false ribs and the abdomen in the direction of the so-called hip-bone (anterior iliac spine).

In the second stage, the fever abates and the pain decreases; if there has been a considerable effusion of serum (causing hydrothorax or dropsy of the chest) the breathing becomes accelerated, owing to the mechanical impediment offered by the serum to the expansion of the lungs; "the pulse small, quick, soft, often intermitting; auscultation [observing the sounds given by the chest on applying the ear to the side] reveals absence of sound in the inferior part of the chest, or a sound resembling that of drops of water falling into a well" (Williams). Dulness of the lower part of the chest, which contains serum, may be observed on percussion.

Symptoms of Bronchitis.—Hoarse painful cough, which is dry at first, but subsequently moist. This cough is not short and suppressed as in pleurisy. The breathing is hurried and the pulse rapid. The lining membranes of the nostrils and eyelids are red and injected. The animal is dull and listless. At first the saliva is thick and ropy. As the disease advances there is a profuse discharge from the nose. If the ear, applied to the side, the sound of the rapid passage of air through the inflamed air-tubes—which are consequently reduced in calibre—may be perceived.

Chest Influenza.—Under this convenient but ill-defined term I wish to class affections of the lungs, pleuræ, and bronchial tubes, which occur in various

forms, but are generally to be distinguished by their epidemic character. (See Chapter XII.)

N.B.—The liver is frequently implicated in an attack of the chest diseases under consideration, as will be indicated by the yellow colour of the gums and lining membrane of the eyelids. The practitioner should neglect these secondary symptoms, and attend solely to the alleviation of the original disorder, resting assured that as it subsides, so will the symptoms of derangement of the liver gradually disappear.

General Treatment for Inflammation of the Lungs, Pleurisy, Bronchitis, and Chest Influenza.

In no department of either human or veterinary medical science, has the progress of knowledge been better marked than in the treatment of lung diseases. Dr. Bennett on the one hand, and Professor Williams on the other, have respectively demonstrated that these affections very rarely indeed prove fatal, when treated according to the rational method, which is indicated the proposition laid down by the former author in his "Clinical Lectures," viz., "That an inflammation established cannot be cut short, and that the object of judicious medical treatment is to conduct it to a favourable termination."

After detailing the success which attended his line of practice, Dr. Bennett remarks, "From these facts it follows that uncomplicated pneumonia, especially in young and vigorous constitutions, almost always gets

well, if, instead of being lowered, the vital powers are supported, and the excretion of effete products assisted. It is exactly in these cases, however, that we were formerly enjoined to bleed most copiously, and that our systematic works even now direct us to draw blood largely and repeatedly in consequence of the supposed imminent danger of suppuration destroying the texture of the lung. Such danger is altogether illusory, and the destruction to lung tissue, so far from being prevented, is far more likely to be produced by the practice." In continuation, the same author states, "I think it has been further shown that in recent times our success in treatment has been great, just in proportion as we have abandoned heroic remedies, and directed our attention to furthering the natural progress of the disease."

I have given the foregoing extracts from Dr. Bennett's work because they indicate most, appropriately the treatment we should adopt towards our patients, and which is the one taught and practised by Professor Williams with most marked success for many years. In fact, I may say that the mortality suffered by horses treated by him for the disease under consideration has, on the whole, been under one per cent.

With the object in view of furthering the natural progress of the disease by supporting the strength, and assisting the excretion of effete products, we should neither bleed, blister, nor give purgatives. Blistering the sides or chest causes so much irritation that it increases the fever, and greatly adds to the distress of the animal. I cannot too strongly impress

on my readers the baneful effects of this practice, and the excellent results obtained by Professor Williams and other veterinary surgeons who have abandoned it. If an aperient be administered, the inflammation already existing is most liable to be increased through sympathy with the condition of the mucous membrane of the intestines. Respecting bleeding, "a consideration of the connection and distribution of the large vessels in the body will still further show the little probability there is of either general or local blood-letting, as usually practised, being capable of influencing the amount of blood in the part actually inflamed.

"How is it possible, for instance, that venesection in the arm can *directly* diminish the amount of blood sent from the heart by the great pulmonary artery to the lungs, by the carotids and vertebrals to the brain, or by the coronaries to the heart itself? In inflammation of those organs, blood-letting to produce any effect must be large, so as to act on the general system *indirectly* by weakening the heart's action and producing syncope, and this at a time when, from no nourishment being taken in consequence of fever, great prostration of the vital powers is to be expected. But whilst this result may certainly be induced by large bleedings, the inflammation in the part is altogether unaffected. The exudation, under these circumstances, which requires more blood in order that it may undergo the necessary transformations previous to removal, is then arrested in its development, and, so far from being rapidly removed, remains stationary, or dies in proportion as the economy is exhausted. If, on the other

hand, small or moderate bleedings are practised, how can they operate even on the principles of those who advocate them? These do not affect the heart, or lower the force of the circulation, even in the neighbourhood of the inflamed part; how, then, can they operate on the stagnant blood in the inflamed part itself?" (Bennett).

We will now consider the general treatment in detail.

The horse should be kept in a large box, well ventilated, but free from draughts. If the bowels be costive give an enema of warm water. Foment the sides with warm water for a couple of hours, dry them, and, in order to prevent the part becoming chilled, rub in the following liniment:—

Soap liniment	-	-	-	$\frac{1}{2}$ pint,
Strong liquor ammoniæ	-	-	-	1 drachm.

Then clothe warmly, so that the skin may act. Hand-rub the legs well, rub in some of the above liniment, and put on straw or flannel bandages to reach well above the knees and hocks. Give the animal plenty of cold water to drink, so that the fluidity of his blood may be maintained, as much as possible, in its normal condition. Keep the horse quiet. Let the food consist of gruel, bran and linseed mashes, scalded carrots, hay, and some green grass or lucerne. Give an ounce of nitre the first day, and half an ounce in a mash, or in the water, on the following days, stopping it when the urine becomes abundant. Drenching should, if possible, be avoided. The nitre assists in stimulating the kidneys to get rid of the effete matter

remaining in the blood. It also seems—as Professor Williams remarks—to diminish the amount of exudation, and to prevent the fibrine of the blood from coagulating, thereby keeping the blood in a fluid state, which is a matter of vital importance, as, owing to the existing fever and inflammation, a large amount of deleterious matter—due to the waste of tissue—will be in the blood demanding oxidation, and if this blood be not kept in a proper fluid condition, it will fail to ramify with ease through the minute blood-vessels of the lungs, where it can obtain the oxygen necessary to its purity. Professor Williams in his lectures strongly advises that, beyond the means I have detailed, the practitioner should do nothing, if he is not absolutely certain that the course he is about to pursue is the right one; that in cases of doubt it is well to wait and to watch symptoms, and that, if leaving the case to nature acted well, the animal should not be interfered with.

In these diseases good nursing is the main thing, the administration of medicine being but of secondary importance.

If, in the *early stages* of the attack, the pulse be very quick and bounding (hard and full), give—

Fleming's tincture of aconite	-	10 drops.
Water	- - - - -	1 pint.

The aconite may be repeated once or twice in doses of 6 or 7 drops at intervals of four or five hours, if the pulse does not become softer. Unless the practitioner is sufficiently experienced to accurately distinguish the nature of the pulse, he should on no account employ

aconite, as it has a debilitating effect on the system, owing to its sedative action on the heart. If the pulse be oppressed or weak, though quick, do not give aconite, for here we have debility clearly indicated.

When the pulse loses its hard character, give daily two drachms of carbonate of ammonia divided between three drenches, with a pint of water to each. If the horse will not eat, add two drachms of nitre to each drench instead of giving the nitre in the food. The carbonate of ammonia acts in strengthening the action of the heart, lowers the temperature of the body, and by its alkalinity tends to preserve the fluidity of the blood. If the carbonate of ammonia be not at hand, give an ounce of sweet spirits of nitre twice a day.

If symptoms of pleurisy be well marked and the pain be very acute, give—

Tincture of opium	-	-	-	1 to 2 oz.
Linseed oil	-	-	-	$\frac{1}{2}$ pint.

If the symptoms of pain continue to be very urgent, $1\frac{1}{2}$ oz. of the tincture of opium may be subsequently given in a pint of water.

If the symptoms of bronchitis be manifest, give in a ball—

Carbonate of ammonia	-	-	-	1 drachm,
Camphor	-	-	-	„
Extract of belladonna	-	-	-	„

twice a day. Steam the nostrils, and if the cough be hard, blister the throat with tincture of cantharides, or with the ordinary fly ointment. If the throat be sore,

no ball should be given, nor should the carbonate of ammonia in any form, as its effects on the throat are most irritating. In this case, a drachm of the extract of belladonna may be placed between the horse's teeth twice a day, so that it may gradually dissolve and pass down.

I must caution the inexperienced horse owner to carefully consider the symptoms; and if he is not quite certain what is the right course to pursue with regard to the *internal* administration of medicine, I would strongly advise him to dispense with it and to content himself with following the general directions I have laid down as regards fresh air and water, fomentations, warm clothing, laxative food, and nitre.

If there be great difficulty in breathing, which will occur when laryngitis is present, tracheotomy may have to be performed. Although this is a most simple operation, still it is generally advisable to defer it as long as possible, from the danger to be incurred of the horse subsequently "making a noise," owing to the chance of the subsequent irregular apposition of the edges of the divided cartilage. When the animal's breathing becomes laboured, he should be carefully watched, and the operation performed the moment he begins "to fight for breath."

If diarrhoea sets in, it is not advisable to check it, as it is almost always an effort of nature to expel effete and deleterious matter from the system.

In the second stage, when the fever has passed off, corn should be gradually given, with, if much debility exists, a couple of quarts of beer a day, or milk with eggs beaten up in it. Discontinue the nitre, and give daily in a pint of ale—

Powdered gentian	-	-	-	3 drachms,
„ ginger	-	-	-	2 „
Sweet spirits of nitre	-	-	-	1½ oz.

If the cough continues, blister the throat.

Nurse the horse, and attend to his general health.

Congestion of the Lungs

Is usually caused by over-exertion, especially when the animal is out of condition; by defective ventilation in the stable; and by cold. The distress is caused by the lungs becoming gorged with non-aerated blood.

Symptoms.—“ Air is taken freely into the lungs, but the circulation almost ceases in them, and in spite of his hurried breathing, as shown by his panting sides, he is almost as completely suffocated as if a cord were tied round his neck. On examining his eyes and nostrils they are seen to be turgid and *purple*, the vessels being filled with carbonized blood, while the heart beats rapidly but feebly, and the countenance is expressive of anxiety and distress ” (Stonehenge).

Treatment.—Give a stimulant such as tincture of arnica 2 oz., spirits 2 glasses, in a pint of lukewarm water; or a quarter of a pint of spirits in water if the arnica be not at hand; or sweet spirits of nitre 2 oz., which should be mixed in cold water. The stimulant may be repeated after a quarter of an hour or twenty minutes. Allow the horse plenty of fresh air to breathe and water to drink. Use warm fomentations to the sides. Place the legs in warm water. Hand-rub the

body, and clothe comfortably. If the symptoms be not relieved, bleed to the extent of about a gallon.

During convalescence give laxative food with $\frac{1}{2}$ oz. of nitre mixed in it daily.

Diffusible stimulants, by quickening the general circulation, tend to relieve congestion. Alcohol in small and repeated doses is a stimulant and diaphoretic (a medicine which increases the action of the skin); in large doses it is a narcotic. Arnica has a special action in stimulating the small vessels of the surface of the body, hence its value in cases of congestion of the lungs.

Sore Throat (*Inflammation of the Larynx*).

(See remarks on "The Anatomy of the Organs of Breathing," at the commencement of this chapter.)

Sore throat is caused by exposure to cold or wet.

Symptoms.—The discharge of mucus (phlegm) from the larynx more or less closes it up, and occasions distress in breathing, "the inspiration being particularly prolonged, and attended by a peculiar harsh sound, succeeded by a short expiratory movement" (Williams). This sound can be heard on applying the ear to the part. There is swelling of the throat under the jaws, and tenderness on pressure at this point. There is a strong hoarse cough, the strength of which indicates that the expulsion of air from the lungs is made with ease, while the fact of the horse shaking his head from pain after coughing, shows that the act of coughing hurts him by reason of the air passing over the inflamed membrane. Hurried breathing. Inside of the nostrils

and eyelids red and congested. Nose poked out. Anxious and distressed expression of face. Eyes prominent. Considerable difficulty in swallowing. Discharge from the nose, and flow of tears from the eyes. In bad cases, cold sweats break out over the body; "the pulse, which may at first be hard and full, soon becomes rapid and indistinct, fulness generally remaining; the visible mucous membranes now assume a livid appearance from non-oxidation of blood; prostration of strength becomes extreme; the animal staggers, finally falls, and dies after a few struggles" (Williams).

Treatment.—Allow the horse a plentiful supply of fresh air. Clothe the body warmly. Hand-rub the legs, rub into them the stimulating liniment—

Soap liniment -	-	-	-	$\frac{1}{2}$ pint,
Strong liquor ammoniæ	-	-	-	1 drachm,

and apply straw or flannel bandages.

Make the horse inhale steam if it does not distress him.

Foment the throat, and after that is done apply the above liniment. If the case be at all serious, blister the throat with cantharides ointment. Give a drachm of the extract of belladonna twice a day; place it between the horse's teeth, instead of giving it as a ball, which would irritate the throat. Give from $\frac{1}{2}$ to 1 ounce of nitre daily, dissolved in the water or food. Allow gruel, linseed tea, and linseed and bran mashes; substitute freshly cut grass for hay. When the attack has subsided, the horse's strength should be kept up by gruel, and milk with eggs beaten up in it. Drenches should not be used, as they would irritate the throat.

After an attack, perhaps it is the safest plan to blister the skin with biniodide of mercury, under the seat of the disease, three or four times in succession, and to put the horse on a course of iodide of potassium, —1 drachm twice a day—for a fortnight or three weeks. The thickening of the mucous membrane, that lines the larynx, may be reduced by the application of a solution of nitrate of silver by means of a sponge. (See treatment for "Roaring.")

The object for blistering and for giving the iodide of potassium is to stimulate the absorption of the exudation which was formed as a result of the inflammatory process.

In severe cases, tracheotomy is often the only means for saving the patient's life.

Catarrh or Cold in the Head

Is generally caused by exposure to cold and wet, aided by change of temperature.

Symptoms.—Catarrh is indicated by sneezing, running from the eyes, redness and dryness of the Schneiderian membrane [the mucous membrane which lines the nostrils], succeeded by a discharge, at first thin and colourless, which soon, however, becomes turbid, yellowish white, and profuse. It is associated with a varying degree of fever, dulness, and debility" (Williams). Cough is generally present.

Treatment.—Put the horse on bran and linseed mashes, and give some freshly cut grass. Allow a constant supply of water to drink. Have the stable well-ventilated,

and keep the animal warmly clothed. Make him inhale steam from time to time in order to facilitate the discharge from the nostrils. If the cough be troublesome stimulate the throat with—

Soap liniment	-	-	-	$\frac{1}{2}$ pint,
Strong liquor ammoniæ	-	-	-	1 drachm.

If a stronger effect be desired, add another drachm of ammonia to the liniment.

Give from a half to one ounce of nitre daily in the food, or as a drench.

Two drachms of camphor, with or without a drachm of belladonna, made up into a ball with a little linseed meal, may be given with advantage every night. If the bowels be constipated, administer an enema of warm water (100° F.).

If subsequently there be great debility, the horse's strength may be kept up with a couple of quarts of beer a day, and an ounce of chirretta (in India), or a drachm of sulphate of iron in the corn.

Simple Cough.

To cure simple cough, bran and linseed mashes with half an ounce of nitre daily in the water for a few days will frequently be sufficient.

In India a small quantity of young bamboo leaves are often given with advantage.

If these simple remedies be not effectual give the following ball morning and evening:—

Belladonna	}	-	-	of each 1 drachm.
Camphor				

The throat may be stimulated with—

Soap liniment	-	-	-	$\frac{1}{2}$ pint,
Strong liquor ammoniæ	-	-	-	1 drachm.

The clothing should be warm, the diet laxative, and no corn should be given. Horses doing fast work are liable to get coughs, if after exercise the hollow space between the branches of the lower jaw be not promptly and carefully dried. The practice of making horses wear "night-caps" (short hoods) tends, I think, to induce coughs.

In India the natives use for coughs, a ball of $1\frac{1}{2}$ drachm of assafoetida made up with onions and linseed meal, to be given twice a day. There seems to be nothing so good as the ball containing belladonna and camphor. In the absence of the former, the latter might be given in doses (in a ball) of $1\frac{1}{2}$ drachm twice a day.

Simple cough is frequently due to the irritation caused by teething, independently of chill. The four-year colt is often affected in this manner. A teething cough is to be distinguished by the fact that it is more violent in the morning than during the other portions of the day, and also that it is continuous.

Chronic Cough

Is often one of the sequelæ of catarrh and bronchitis. It may accompany broken wind, roaring, indigestion, worms, &c.

Treatment.—Give green food and bran and linseed mashes. Carrots "are beneficial in all chronic diseases

of the organs connected with breathing, and have a marked influence upon chronic cough and broken wind" (Stewart's "Stable Economy"). Blister the throat with cantharides ointment, and give the ball recommended for simple cough. If worms be present, treat for them. If the cough has been caused by a previous attack of bronchitis, try a course of iodide of potassium as recommended for sore throat.

Referring to arsenic, Mr. Finlay Dun remarks, "I find it useful amongst horses in relieving chronic irritable cough, especially when remaining after attacks of influenza and sore throat. In such cases, with an ounce of Fowler's solution [liquor arsenicalis] is advantageously united an ounce of potassium chlorate, and a drachm of belladonna extract, made into a draught with water or gruel" ("Veterinary Medicines").

Asthma or Broken Wind

Is a rare disease, and only to be found among ill-kept horses. It is probably at first a nervous affection, and "is generally due to improper food, more particularly to bad, musty, or coarse hay, containing a large quantity of woody fibre, from being allowed to become too ripe before being cut, and to a superabundant allowance of hay of any kind, with a deficient supply of corn" (Williams). In the process of breathing, air is taken into the lungs in a natural manner, but is expelled from them by two distinct efforts, the muscles of the abdomen aiding in a marked manner the final act of expiration; this is apparent by the heaving of the flanks. There is a peculiar cough.

* The difficulty of breathing is constant, but varies in intensity, being greatest after the horse is fed. The digestion and general health of an animal suffering from this disease are usually much out of order.

This affection is usually ascribed to the presence of air in the cellular tissue surrounding the lobules of the lungs, after rupture of some of the air-cells; hence the difficulty experienced by the animal in expelling the air taken into the lungs at each inspiration.

Treatment.—The treatment can only be palliative. Feed and water the horse by small quantities at a time. Give carrots. Limit the amount of dry hay; substitute for it fresh-cut grass. A pint of linseed oil may be given now and then to keep the bowels in order, and to allay irritation of the mucous membrane.

The general health of the horse, and the proper ventilation of the stable should be attended to. He should be kept short of food and water before being worked. An ounce of liquor arsenicalis increased up to two ounces a day, given in his food for a fortnight, might be tried.

When doing continuous work for some hours, small quantities of gruel or water given occasionally are of benefit, as total deprivation of water is almost as bad as giving it in excess.*

A pound of lard or butter, which may be given in balls, acts in abating the distress for a few hours.

Damp forage is recommended in this complaint. Professor Trasbot, of Alfort, referring to palliative measures, remarks: "We will only cite damped hay, green food, and above all, forage wet with molasses and water. This last regimen, employed often in the north of France, has given most satisfactory results."

Roaring and Whistling.

There is some diversity of opinion regarding the nature and causes of roaring and whistling, but for all practical purposes they may be considered to be varieties of the same affection.

Whistling is a sound resembling to some degree the noise from which it takes its name, made by the horse, in a marked manner, during the act of inspiration, and also, though to a much lesser extent, during the act of expiration (Williams). It is generally due, as a result of disease, to diminution of the calibre of the larynx, owing to thickening of its mucous membrane. As the vocal sounds of the horse are produced by the passage of air through the larynx, the structural alteration just described, by diminishing the calibre of the tube, naturally renders their tone higher, hence the objectionable sound. It may also be caused by the continued use of a tight bearing-rein, or standing martingale. It is stated to be sometimes due to hereditary predisposition.

This disease is an unsoundness which unfits the horse for fast work.

Roaring also takes place during inspiration, but in tone it is much louder, and not shrill like whistling. It is generally due to an imperfect action of the muscles that open and close the larynx. This is caused by these muscles being affected by a form of wasting palsy, a nervous disease which usually attacks the muscles on the left or near side of the throat.

On account of this atrophy of the muscles, the walls of the larynx tend to fall in, which causes a diminution in

the size of this tube, through which air passes to and from the lungs.

It may also be due to diseases and injuries of the nasal cavities, distortion of the larynx from the use of tight bearing-reins, imperfect apposition of the edges of the wound made into the windpipe for the operation of tracheotomy, &c.

In mild cases, the disease is usually not apparent unless the animal is put to a fast pace. At the commencement of the affection, the noise is often heard only when the horse begins exercise, and wears off as the work is continued. If the noise is worse at the end of a gallop than at starting, he may be regarded as a confirmed roarer.

"In addition to the sound emitted during inspiration, the roarer generally has a cough which is diagnostic, being a loud, harsh, dry sound, half roar, half cough; and the generality of roarers are also grunTERS. It will also be found that the sensibility of the larynx is diminished in confirmed roarers, and that consequently it is difficult to make them cough in the ordinary way by pressing the larynx. In testing a horse for his wind, it is usually the practice with some to place him against a wall, and threaten him with the whip; if he grunts, he is further tested; if not, he is merely made to cough by pressing the larynx, and if the cough has a healthy sound the animal is generally

"This plan is not always satisfactory, and the better way is to have the animal galloped, or if a cart-horse, to move a heavy load some little distance, when, if he be a roarer, he is sure to make a noise" (Williams). A

soft piece of ground should be chosen for the gallop, so that the clatter of the horse's feet may not interfere with the detection of the objectionable sound.

In India, roaring is almost, if not quite, unknown among country-bred horses, although many of their imported sires have been confirmed roarers. This points to the fact that it is a disease peculiar to certain climates—damp cold ones, I venture to suggest. The disease seems to be as rare among Arabs as it is among the Indian stock. The horses at the Cape of Good Hope too, I believe, enjoy a considerable immunity from this complaint. In England, roaring may generally be traced to hereditary predisposition.

I have met with some, though comparatively few instances, of roarers among well-bred Australian horses; I mean those of pure, or nearly pure English blood. Among our racing stock this affection is extremely frequent; it is sometimes met with in cart-horses and half-bred animals.

Treatment.—In confirmed cases no active treatment is of use, but in the early stages—especially when resulting from some throat affection—we may put the horse on bran mash and cooling food, and blister repeatedly under the jaw with biniodide of mercury (1 to 8 parts of lard).

Sprinkle the corn with water before feeding. Give carrots. Mix a couple of ounces of linseed oil in one of the horse's feeds daily, or give a bran and linseed mash every second night. Avoid an excess of dry hay. Allow a longer time than usual to elapse between feeding and work. About a third of a pint of olive oil, or melted butter, will act well

as a sedative. It may be given to the roarer—if a race-horse—half an hour before running. “I have no doubt that roarers might be improved a stone if they were trained from an open shed, sheltered from wet and rain, keeping them warmly clothed, and always in the open air” (Admiral Rous). To modify the admission of air into the lungs, Mr. Reeve (*Veterinarian* for 1858, p. 486) suggested the use of a strap to pass over the false nostrils of the horse. This strap to be fixed to each side of the bit, and to be kept in position by a strap at each side attached to the headstall of the bridle. “To the inner surface of this strap, and immediately over the false nostril at each side, was fixed a body resembling in shape the half of a hen’s egg, cut longitudinally. When applied, these bodies pressed upon the triangular spaces formed by the apex of the nasal bones and upper jaw, thus closing the false nostrils, and partly diminishing the channel of the true ones.” In cases of thickening of the mucous membrane of the larynx, Stonehenge recommends that “when the case is very intractable, the nitrate of silver (ten or fifteen grains in the ounce of distilled or rain water) may be applied to the part itself by means of a sponge fastened to a piece of flexible cane or whalebone. The mouth should then be kept open with the ordinary balling iron, and the sponge rapidly passed to the situation of the top of the larynx, held there for a second, and then withdrawn.”

Thick Wind.

This term signifies an impaired condition of the horse's powers of breathing, unaccompanied by noise, or by any peculiarity in respiration or expiration. When put to fast work, or to violent exertion, his breathing becomes more accelerated, and he himself more distressed than ought to be the case were his organs in a normal state, taking into consideration his working "condition"; while his flanks continue heaving for a long time after he has ceased labour. This state is usually the result of thickening of the bronchial tubes, owing to a previous attack of bronchitis, and is often accompanied by a chronic cough. Palliative treatment similar to that recommended for broken wind and roaring might be tried.

Highblowing.

Highblowing is not a disease, but is simply produced by the flapping of the horse's nostrils when expelling air quickly from his lungs. The larger, thinner, and more delicate the horse's nostrils are, the easier will it be for him to make this noise, which appears to be under his control. It is rarely heard except at the canter or gallop, and seldom when the horse is "doing all he knows." It is generally considered to be a sign of good wind. One can imitate the sound near enough to understand how it is made, by bringing the lips of one's mouth lightly together, and then blowing moderately strong through them. If one blows very hard, the vibratory noise is not made.

Strangles.

Following the classification adopted by Professor Dick, we may define strangles to be a catarrhal affection accompanied by abscess under the jaw, with slight fever.

It is a disease which principally attacks young horses, and rarely, if ever, affects the same animal twice. It is doubtful whether or not it be contagious, though the crowding of young stock certainly seems to favour its spread.

Symptoms.—In ordinary mild cases, the horse is dull, feverish, and off his feed. A tumour, which is at first hard, appears in the hollow between the branches of the lower jaw, and comes to a head in about ten days. In another form of the disease, for a month or more before the abscess forms, the animal loses condition, his coat stares, and he becomes "hidebound," he has a cough, and is out of sorts. This state has been sometimes mistaken for glanders. In strangles there is generally more or less difficulty of breathing.

Bastard strangles is the term applied to a low and very serious form of this disease; several indolent abscesses form in various tissues, and do not come to a head, after running a regular course, as they do in simple strangles. These abscesses sometimes form under the elbow, and even in the mesentery. In the latter case, recovery is all but hopeless.

Treatment.—If the colt or horse be at grass, he should be taken up and comfortably stabled, crowding being avoided. In mild cases a laxative but fairly generous diet ought to be given, and may consist of bran and lin-

seed mashes, with a little corn, boiled barley, carrots, and freshly cut grass. The swelling under the jaw should be frequently fomented with warm water ; while at other times the part should be kept warm by means of flannel, wool, &c. When the abscess points, and becomes fluctuating, it should be opened with the knife or lancet. The part should be well fomented, and a small plug of lint placed in the opening, in order to facilitate the discharge of the matter. If the tumour appears indolent, Professor Williams recommends a fly blister to be applied, and twenty-four hours afterwards a warm poultice. Some nicety of arrangement is requisite here to adjust a poultice properly. Premature lancing of the tumour should be carefully avoided. During the after treatment the horse should be liberally fed, and may have a couple of quarts of beer a day, with half a drachm of sulphate of iron in his food twice a day for ten days or so. As there is danger and difficulty in drenching, that operation should be dispensed with as much as possible.

When the breathing is painful, the horse may be made to inhale steam, and after the throat is well fomented, a mustard poultice may be applied to it. If the breathing becomes very difficult—the animal fighting for breath—tracheotomy must be performed.

In all cases, the horse should be most carefully nursed and the sanitary conditions of the stable should be attended to. Both in bastard strangles, and in the form in which there is a long premonitory period of ill-health before an abscess appears, the animal should be liberally fed, and if his appetite fails he may get milk and eggs. A quart of ale twice a day will be a most useful tonic.

In India an ounce of powdered Chirretta may be given twice a day in the food. If a horse will not eat it, make it into a decoction and give it in the ale. In cases of great debility, give an ounce of liquor arsenicalis, or five grains of arsenic daily in the food for about ten days at a time.

Roaring and glanders are among the sequelæ of strangles. The fact of a horse having passed safely through an attack of this disease certainly tends to increase his value,

CHAPTER X.

DISEASES OF THE STOMACH AND INTESTINES.

SPASMODIC COLIC—FLATULENT COLIC—INFLAMMATION OF THE INTESTINES—SUPERPURGATION—DIARRHOEA—INDIGESTION—INTESTINAL WORMS—CRIB-BITING AND WIND-SUCKING.

Spasmodic Colic

Is spasm of the muscular coat of the intestines, caused by irritation due to the presence of undigested matter. It is generally induced by injudicious watering and feeding, especially when the horse is exhausted from hard work and long fasting, for then the digestive apparatus is in a weakened state. Some animals, from natural or induced weakness of these organs, are prone to colic at all times.

There is little difference between the two forms of this complaint, except that flatulent colic is accompanied by the evolution of gas.

Horses that are subject to colic without ostensible cause should be regarded with extreme suspicion, for such attacks are often indicative of the presence of calculi in the bowels, or of other grave affections.

Symptoms.—"The symptoms are—sudden pain, pawing, kicking at the belly, looking round at the flanks, lying down, rolling, struggling in a variety of ways, or lying outstretched; then suddenly rising, shaking the body, and remaining for a short period free from pain.

After a short interval, however, the symptoms return, sometimes in an aggravated, occasionally in a modified form, and this occurs again and again, until the animal is either relieved or dies from pain and exhaustion" (Williams). During the intervals of rest the breathing, pulse, and skin are natural. The skin over the abdomen is not sensitive as it is in inflammation of the bowels; while pressing and rubbing it seems to soothe the animal. During the periods of pain the pulse is quick and *full*. The most diagnostic symptom is that the pain is intermittent. If the body continues wet with sweat the case may be deemed a very serious one.

As mistakes are liable to be made in distinguishing between colic and inflammation of the intestines (enteritis), I would most strongly advise the amateur to carefully study the symptoms of both diseases before deciding on a doubtful case.

Treatment.—Mr. Gamgee teaches that colic being due to the presence of some undigested irritating substance in the bowels, its rational treatment is removal of the offending matter by purgatives and enemas. But if the attack be slight, or if it be taken early, I would advise, in case it would not be convenient to throw the animal out of work for two or three days, to try the effect of an antispasmodic—which aids, by stimulating the intestinal canal, to digest the cause of irritation, or to expel it onwards—before giving a purgative. Then if relief be not obtained, say after half an hour, by the former, the latter should be administered. Either of the two following drenches—which are similar to those recommended by Mr. Percivall—will do, if given in a pint of water :—

Sweet spirits of nitre	1½ ounce,
Tincture of opium -	1 „

Or

Tincture of opium -	1 ounce,
Turpentine - -	2 ounces.

Or the following ball :—

Opium - - -	1 drachm,
Camphor . - -	2 drachms.

Or, if nothing else be at hand, give a quart of warm ale, fortified by a couple of glasses of spirit, and a table-spoonful of powdered ginger.

If the antispasmodic be not successful, it should on no account be repeated, but the horse should get, without loss of time, a physic ball, or 1½ pint of linseed oil if the aloes be not procurable. Keep the animal quiet in his stall with plenty of bedding under him, and do not distress him by exercise. Administer one or two enemas of warm water (100° F.); foment and hand-rub the abdomen; keep the horse warmly clothed. If the bladder be full pass a catheter.

If the pain continues to be very great, give from 1½ to 2 ounces of tincture of opium in a pint of water. If neither opium nor its tincture be at hand, give 2 drachms of camphor made into a ball.

Above all things exercise patience, and do not continue giving opiates. After the physic, one sedative is quite enough, and even that should not be administered unless the symptoms of pain are great.

On no account delay giving a purgative if the case has been allowed to run on, or if the symptoms are at all urgent. The oil will hardly at all stop a horse in

his work; it is, however, not nearly so efficacious as aloes for removing the obstruction.

Flatulent Colic.

This dangerous form of colic is due to the distension of the bowels by gas, resulting from the decomposition of undigested food contained in them. It sometimes follows spasmodic colic; in this case, first we have spasm due to irritation set up by the presence of undigested matter; and secondly, distension, owing to its decomposition.

We may readily conclude that flatulent colic is caused by errors in feeding and watering the horse. Perhaps he has been fed on a quantity of rank grass or watery roots, which, on account of their moist nature, are quickly swallowed without being properly masticated; the gastric juice, being too largely diluted, by the fluid portion of the forage, performs its office imperfectly, decomposition takes place, and the bowels become filled with gas. Or the thirsty horse after feeding may have had a draught of water, which may have diluted the gastric juice to an injurious extent, and we may get a case similar to the one just described. Or the horse may have been worked soon after being fed. Here the muscular labour may check the secretion of gastric juice, and distension and colic will probably follow.

In India, horses are generally fed on a grain called *gram*, which is very similar to peas in its composition. As it is hard and dry, some persons ignorantly

consider that it should be well soaked in water before being given to the horse; if this be done the grain is imperfectly masticated, and the *bolus* of food instead of being thoroughly mixed with saliva, in which state it would have been ready for reception by the stomach, is simply saturated with water. Sometimes the grain is steeped so long that fermentation actually commences. I need hardly say that this system of feeding is a fruitful source of indigestion, and a not uncommon one of colic. I may here remark that, the drier the food the greater is the amount of saliva secreted into the mouth for its preparation, and that bruised or crushed grain demands more perfect mastication than unbroken corn. A whole oat, or a whole grain of other corn, owing to its smooth surface, may be readily swallowed if it be simply coated with saliva or water; while in a bruised or crushed state it would first require to be ground down between the teeth.

Watering after feeding was, some years ago, a not unfrequent practice in batteries of artillery and regiments of cavalry in India, and was of course attended by many cases of colic, with instances of rupture of the stomach now and then. I am glad to say that such barbarous methods are falling into disuse in that country. Watering after feeding is particularly dangerous when gram is used, as that grain expands a good deal under the action of water.

Symptoms.—The symptoms resemble those of spasmodic colic, except that they are less violent, though much more continuous, and there is considerable distension of the abdomen. The breathing is difficult, and there is more or less delirium.

Great distension of the abdomen^{*} is often a sign of a fatal termination of different diseases, as in superpurgation for instance.

Laminitis sometimes ensues after an attack of this form of colic.

Treatment.—Give as a drench—

Linseed oil	-	-	-	-	12 ounces,
Tincture of opium	-	-	-	-	1 ounce,
Turpentine	-	-	-	-	2 ounces.

The oil is given as a gentle laxative and vehicle for the turpentine; the opium allays pain; while the action of the turpentine, though well marked, is difficult of explanation. It diminishes the distension, but how I am not prepared to say with confidence; perhaps, by stimulating the muscular coat of the intestine to expel the gas.

We may repeat the tincture of opium in doses of 2 ounces in half a pint of linseed oil once or twice. Foment the belly and give an enema, or at furthest two enemas, of warm water (100° F.). Hand-rubbing the abdomen will afford relief. I would advise that the horse should not be back-raked, and that not more than two enemas should be given, lest the part be made so sensitive and irritable that the animal will be afraid to pass wind.

Inflammation of the Intestines (*Enteritis*).

According to Professor Williams the chief seat of this disease is the mucous lining of the bowels.

I may here mention that the bowel is composed of three layers or coats, viz., the serous, muscular, and the mucous or inner layer.

This disorder generally proves fatal, and usually runs its course in a few hours.

The attack often appears to come on without any assignable cause,—in fact, as if it were a species of carbonous disease located in the intestines. It may be a termination of colic, as the presence of any irritating matter may bring it on. It may also be caused by over-fatigue and chill.

Laminitis sometimes follows after an attack of enteritis.

Symptoms.—As all inflammations of the mucous membranes are characterized by a tendency to spread over the entire mucous surface, we find that, in this disease, the membranes of the eyelids and nostrils are red and injected; the expression is very anxious; the temperature of the body is lower than usual; the pulse wiry (small and hard) and quick, often reaching to over 100 beats in the minute—normal pulse about 38. The pain is continuous, without the remissions so characteristic of colic. Pressure on the abdomen with the hand gives pain. In the first stages of the attack the horse shows that he is averse to pressure on the belly, by the careful manner in which he gets down on the ground to roll, and by the way he kicks at, or rather pretends to kick at, his abdomen. “The continuance of this torturing pain

drives the animal to a state of extreme restlessness and distress ; he is either pawing, or repeatedly lying down and rising again ; or else he is walking round his box, breathing hard, sighing, and perhaps occasionally snorting. At length his respiration becomes hurried and oppressed ; his nostrils widely dilated ; his countenance painfully anxious and expressive of his sufferings ; his body bathed in sweat at one time, but at another cold, and occasionally seized with tremor ; and his tail erect and quivering.

“ The next stage borders on delirium. The eye acquires a wild, haggard, unnatural stare ; the pupil dilates ; his heedless and dreadful throes render approach to him quite perilous ; in short he has become an object not only of compassion but of apprehension, and seems fast hurrying to his end ; when all at once, in the midst of agonizing torments he stands quiet, as though every pain had left him, and he were going to recover. His breathing becomes tranquillized, his pulse sunk beyond all perception ; his body bedewed with a cold clammy sweat ; he is in a tremor from head to foot, and about the legs and ears has even a death-like feel. The mouth also feels deadly chill ; the lips drop pendulous ; and the eye seems unconscious of objects. In fine, death, and not recovery, is at hand. Mortification has seized the inflamed bowel ; pain can no longer be felt in that which but a few minutes ago was the seat of exquisite suffering ” (Percivall).

Distinguishing Signs between Enteritis and Colic.—As inflammation of the intestines may be mistaken for colic, I may state that the chief differences between the

symptoms of the two is that in the latter the pain comes on in paroxysms, between which there are intervals of ease; the pulse and breathing are almost if not quite in a normal condition during these periods, while the state of the skin and mucous membrane is natural; rubbing and pressing the belly with the hand seem to ease the pain; and the animal appears to obtain temporary relief from rolling on the ground. In enteritis the very reverse of all this is the case, while the mucous membranes are red and injected, and the skin colder than usual. During the paroxysms of colic the pulse is quick and *full*, not quick and *wiry* (small and hard), as in the other disease.

Treatment.—As pointed out by Professor Williams, the proper function of the bowel being arrested by the presence of inflammation, sedatives and not purgatives are indicated. As the agony is so intense, and the consequent danger to life so immediate, an extremely large sedative should be administered. Hence give $\frac{3}{4}$ oz. of opium, or 6 oz. of its tincture, or 4 drs. of the extract of belladonna.

Although I cannot speak from practical experience on the matter, I believe that excellent results have been obtained by the employment of belladonna, which seems to be specially indicated in this disease, as it is not alone beneficial as a sedative, but it also tends to relieve the actual inflammation by causing contraction of the muscular coats of the blood-vessels of the inflamed part.

The body may be fomented with warm water, and an enema of the same fluid at 100° F. may be given.

During convalescence, care should be observed concerning the horse's food, which may consist of small

quantities of bran and linseed mash, with a few scalded carrots and a little grass after a time. Dry food should be avoided.

Superpurgation.

Causes.—Giving too strong a purgative. Giving a second purgative before the first one has commenced to act. Exercising the horse before, or soon after the physic has “set.” (Physic is said to “set” when the purging ceases and the dung begins to assume its normal appearance.) Administering physic without preparing the animal for it. Allowing him to drink a quantity of cold water shortly after getting physic. Giving physic on an empty stomach, &c.

We may learn a useful lesson from the following extract from Professor Williams’ work: “It is a fact that the longer a purgative is retained in the body, the greater the danger from its superaction.”

Symptoms.—Frequent purging. Loss of appetite. Debility. Weak pulse. The dangerous symptoms are—offensive breath, and bad smell from the evacuations; glassy eyes, and distension of the belly with cessation of purging, for here the loss of function of the bowel is caused by its becoming inflamed. Laminitis not infrequently results from superpurgation.

Treatment.—If the horse looks lively and retains his appetite, the action of the physic should not be checked further than by keeping him warmly clothed, quiet, and allowing him only small quantities of thin gruel made from flour or rice, or boiled milk to drink, taking

great care that the milk, if it be used, is not smoked in the slightest. On no account give linseed or roots, as they are both laxatives.

If the horse gets worse, or if symptoms of colic appear, foment the belly with hot water, and give 2 oz. of tincture of opium in a quart of rice or starch water: water boiled with a little flour to a like consistency will do. If this does not afford relief, repeat, after a couple of hours, the tincture of opium and rice water combined with $1\frac{1}{2}$ oz. of sweet spirits of nitre. If the horse be very weak, a bottle of port wine may be given. If neither opium nor its tincture be at hand, substitute for them camphor in 2-drachm doses. To support the strength give boiled milk with eggs beaten up in it (Williams). In superpurgation, a few bruised oats and dry bran with some well-preserved hay is much to be preferred to bran mashes, as bran in that form is a laxative.

If distension of the abdomen appears, give 2 oz. of turpentine in a pint of gruel.

During convalescence the patient should be very carefully and gradually brought on to his natural food, and he should be kept quiet and free from excitement. Any unexpected or unusual noise or bustle may bring on a fit of purging.

Diarrhœa.

Many horses, more particularly slack-loined, slight, "washy" animals, purge if excited by exercise; or, if race-horses, by being brought on to a race-course. Such animals are often liable to diarrhœa from trifling changes of food or of temperature. Diarrhœa may be simply an effort of nature to expel some irritating matter from the bowels. In this case it should on no account be prematurely checked. It may be due to worms, or to working the horse soon after he has drunk a large amount of water subsequent to a long abstinence from it. Watering a horse frequently, and to a moderate extent each time, on a long journey is most beneficial, in fact when an animal is heated water is absorbed far more readily than when he has cooled down; and we may lay it down as a rule that water never can do harm, if given only in such quantities as will be rapidly absorbed, say a gallon and a half when the animal is hot.

In India, horses frequently get diarrhœa from being fed on an excess of gram, a grain almost identical in composition with peas. The derangement here is due to there being more nitrogenous matter in the food than the system can assimilate. A cure may be rapidly accomplished by giving a few bran mashes, followed by a considerably decreased supply of gram, which may be mixed with dry bran, bruised oats, or boiled barley and dry bran.

"Washy" horses that are inclined to scour should, as a rule, be fed on bruised oats in preference to any other grain. A limited proportion of beans may be used with advantage.

3 lbs. or 4 lbs. of dry bran, divided between the four or five feeds which a horse gets daily, will have a binding effect; while linseed and bran mashes will aid in allaying irritation. Colonel Fitzwygram remarks that "to horses predisposed to scour water should be given frequently and in reduced quantities, and in winter the chill should be taken off by mixing it with a very little warm water. Perhaps the best plan is to leave water always before such horses, because when so supplied, they drink less than when watered at intervals. . . . If the reduction of the quantity of water does not produce the desired effect, it may be mixed with a little wheaten meal. . . . Horses disposed to scour should be stinted of their water before going to work. Some horses will scour unless a little hay be given to them in the morning before they are watered."

These horses should always have hay in the stall at the same time as they are consuming their allowance of corn, in order to induce them to vary the corn with the more bulky food, so as to comply with the well-known law that the food of the horse must have a certain bulk with which to adequately fill his intestines, which are of large volume.

Professor Dick, in his "Veterinary Papers," remarks that "the digestive organs of the horse, like the ox, &c., are very capacious, and are evidently intended to take in a large proportion of matter containing a small proportion of nutriment. And if the food, therefore, upon which they are made to live is of too rich a quality, there is, by the excitement produced, an increase of the peristaltic motion [vermicular action of the intestines] in order to throw off the superabundant quantity,

which has been taken into the stomach and bowels. It is necessary to give, therefore, a certain quantity or bulk, to separate perhaps the particles of nutritious matter, that the bowels may be enabled to act properly on it."

If the horse be a greedy feeder, he should have some hay before each feed.

The oats given should always be bruised, for in that state they will require a more thorough mastication than when whole; besides, the hard husk, which might have an irritating effect on the intestines, will become broken up.

The corn should be given from a box on the ground, so that the animal may be obliged to take a considerable time over its consumption.

In cases where the diarrhœa is brought on by improper food, give a pint of linseed oil and attend carefully to the diet. In all cases try bran and linseed mashes for two or three nights. Substitute rice water or thin flour gruel for the plain fluid for drinking. Give bruised oats and dry bran, and keep the horse warmly clothed and comfortably stabled. If the case does not yield to these simple measures, give once or twice a day, after purging, an ounce of tincture of opium in a pint of rice water. If this fails, give the following ball:—

Powdered opium	-	-	-	1 drachm,
Powdered catechu	-	-	-	2 drachms,
Prepared chalk	-	-	-	4 ,,
Treacle enough to make up into a ball.				

A little port wine, spirits and warm water, or ounce

doses of sweet spirits of nitre may be given now and then, if the horse be very weak.

One should always be careful not to administer too much physic, nor to check the diarrhoea suddenly by medicines, when milder means might suffice.

The not very uncommon practice, among horse dealers and grooms, of giving arsenic to improve the appearance of the skin, tends to cause corrosion of the coats of the intestines, and to render the animal liable to diarrhoea.

Indigestion.

The usual causes of indigestion are —

1. Improper food. The food of the horse should be dry, for if it be boiled or soaked in water, it will be readily taken into the stomach without undergoing the necessary preparation in the mouth. The office of the saliva is to convert a portion of the starch into grape sugar, and also to furnish a certain amount of atmospheric air to the stomach, which it does by means of its frothy nature. The food should also be of a certain bulk in order to fill the intestines, and the nutritious part of the food should be diluted in order that it may not irritate the intestinal canal; hence it is good stable practice to allow a portion of hay with each feed of corn, so that the horse may consume them together, in the same way as we ourselves vary meat with vegetables at our meals; or if he is a greedy feeder he may have some hay before being fed. As a rule, oats should be given in a bruised state, for if taken whole, they are often swallowed without being broken between

the teeth. Indian corn and raw barley, if used, require, generally, to be crushed, and their particles separated by mixing them with bran or chaff. Turnip tops and immature roots, from the large quantity of oxalic acid they contain, often disagree with the horse. Potatoes, too, have frequently a similar effect; while musty hay and inferior fodder of all sorts not alone affect the horse's digestion, but may also produce diabetes, and affections of the skin and of the respiratory organs, &c. A too large supply of nitrogenous matter, particularly when beans, peas, or gram (in India) are given, causes indigestion.

2. Imperfect mastication. The animal may bolt his food, in which case it might be mixed up with chopped hay, or it may be given in small quantities at a time and spread out inside a broad box placed on the ground. If the defective mastication be due to imperfect teeth, they should be carefully attended to by filing them down, &c.

3. Improper watering. If it be not practicable to have a constant supply of water before the horse in his stall, he should have as much water as he will drink, at least twice a day before being fed, but never soon after feeding. On finishing work he should always get a drink, say half a bucketful; and on a journey he should be frequently watered.

4. Irregularity in feeding. To keep a horse in health he must be fed regularly; any deviation from his usual hours will more or less upset his digestion.

(Respecting the foregoing causes of indigestion see remarks on "Diarrhœa.")

5. Improper division of feeding hours. As food

passes rapidly through the horse's stomach, he is unable to bear long fasts, experience proving that he should not be kept without food for much longer than four hours at a time; hence we find that a horse in work requires at least four, if not five, meals a day, the first to be given as soon as the stable is opened in the morning, and the fourth or fifth feed the last thing at night.

6. Improper use of medicines. A great deal of harm is done by condition powders, diuretics, alteratives, tonics, &c., being indiscriminately used to improve a horse's condition. When medicines are not specially indicated, their employment almost invariably does mischief.

7. Insufficient exercise and grooming. The contraction of the muscles during movement quickens the circulation, and thus keeps the liver and the other organs, which are concerned in the digestion of the food in a sound state; while the increased action of the lungs purifies the blood, and assists in maintaining the general health. Grooming increases the action of the skin, while the mucous membrane of the intestines, being continuous with it, participates in the healthy tone imparted to it by that operation.

Symptoms.—The animal loses condition. Generally his appetite is capricious and depraved; there is often acidity of the stomach, as evinced by his grinding his teeth, and by his partiality for licking whitewashed walls. He may crib-bite or wind-suck. The mouth has a sour smell. Cough often accompanies indigestion. "His coat has an unhealthy aspect; it is what is called *pen-feathered* and arid, and perhaps scurfy; nor

is it shed at the usual season. He is also hidebound. His dung has not the appearance it ought to have ; it is either darker or lighter than is natural, has an offensive odour, and, when broken, crumbles to pieces, and appears to consist of lumps of loosely compacted chopped hay, mingled with many entire or imperfectly changed oats. In the stable, the horse is mostly inclined to be costive ; but when taken to work or exercise is soon excited to purge" (Percivall). He is often subject to colicky pains, and the abdomen is frequently distended with gas, owing to debility of the digestive organs, which cannot assimilate the food before it decomposes, which it quickly does when, through derangement of the liver, the antiseptic action of the bile is wanting.

Treatment.—Beyond advising the reader to avoid the causes of indigestion, I have little to say regarding its cure, which is, on the whole, a mere question of diet and good stable management. A gentle laxative, such as a few drachms of aloes, or a pint of linseed oil, may be of use. If there be acidity of the stomach, give one ounce of the bicarbonate of soda twice a day in the horse's food ; this, besides being an antacid, is a sedative to the mucous membrane.

The horse should have the free use of salt, say two ounces a day, or he may have a lump of rock salt in his manger. If there be debility, give vegetable tonics. The one I prefer is a quart of ale with two drachms of gentian twice a day. In India two ounces of powdered chiretta may be given in the food every day. If the action of the liver be suspected to be at fault, try a course of dilute nitro-muriatic acid, $1\frac{1}{2}$ drachm in a

quart of water twice a day. It seems to have a beneficial effect in restoring the liver to a healthy state, and also in removing the condition of the skin known as "hidebound." In debility, with paleness of the mucous membranes, indicating poverty of blood, we may give—

Sulphate of iron	-	-	-	-	1 drachm,
Powdered cantharides	-	-	-	-	5 grains,

twice a day. The use of the iron should be stopped as soon as it imparts a dark colour to the fæces; for this shows that it is not assimilated, in which case it will act as an irritant to the intestines.

When everything else fails in restoring the horse to health, try the effect of a run at grass, not forgetting to allow him a supply of salt.

Intestinal worms.

There are two kinds of worms commonly met with in the intestines of the horse:—1. Round worms or lumbrici (so called), which are very like common earth-worms. Their usual habitat is the small intestines, though they are sometimes met with in the stomach, their presence in that organ usually causing considerable derangement. When these worms infest the horse in considerable numbers, he falls away in condition, and his general health is more or less affected, which may be evinced by a morbid state of the appetite, rough coat, &c.; while often, on account of irritation due to the presence of these parasites, mucus comes away with the fæces.

2. The second kind, or thread worms (*ascarides*), are thread-like parasites about an inch and a half long, and generally are found in the rectum—the large straight intestine terminating at the anus—though sometimes in the colon, or cæcum. Their presence produces little disturbance of the animal's general health, although it may cause irritation about the dock, which is evinced by the horse rubbing his tail. Accompanying this irritation, a lightish yellow waxy substance—eggs of the parasite (Williams)—will be found adhering to the part immediately below the anus.

Tape and other worms are met with, though very rarely, in the horse. The principles to be attended to for their removal differ in no wise from those to be observed in treating the animal for the two more common kinds.

In the removal of these parasites two conditions must be attended to,—1. Their destruction or expulsion. 2. After their ejection, the employment of “means calculated to restore the digestive organs to a healthy state, and to correct that peculiar condition of them (*helminthiasis*) which promotes the generation of intestinal worms. The means best calculated for this purpose are—keeping the body warm by proper clothing, a light but nutritious diet with a moderate use of common salt, and at the same time the administration of bitter tonics with gentle aperients, and, if anæmia [deficiency and poverty of the blood] be present, the preparations of iron” (Neligan's Medicines).

The best treatment for round worms consists in giving $1\frac{1}{2}$ drachm each of tartar emetic and sulphate of iron in the horse's food every day for a week, and then

administering a purgative, keeping the animal in the meantime on bran and hay: although this diet will weaken him for a short time, still it will also affect the parasites, and induce them the more readily to quit the intestines. Tartar emetic, whose effect is but slightly depressing on the horse even when given in very large doses, appears to have a most nauseating influence on the parasites, which readily come away when subjected to its influence. In bad cases, a second course of tartar emetic and sulphate of iron, followed by a physic ball, may be tried after an interval of a week. After this, the animal may get (if in India) an ounce of finely powdered chiretta in his food twice a day, or a drachm of sulphate of iron every day for a fortnight or three weeks.

For threadworms, give an enema of warm water to clear out the rectum, and then another enema of six or eight ounces of oil of turpentine in a quart of linseed oil.

Turpentine is a most valuable vermicide; it should be given in full doses, for in small ones it is a diuretic, and should be repeated only at long intervals. Owing to its irritating effect on the mucous membrane, it should be given in oil, which is also a vermicide in that it clogs up the skin of the worms through which they breathe.

Turpentine causes death to the parasite on contact, which readily takes place owing to its being volatile. The usual dose is three to four ounces in a pint of linseed oil.

The free use of common, or rock salt, is perhaps the best preventive against an attack of worms in the horse: its action, in this respect, is probably due to

the beneficial effect it exerts on the animal's general health.

Crib-biting and Wind-sucking.

As these stable vices are connected with derangement of the organs of digestion, I have classed them under the present heading.

The crib-biter is one that has acquired the habit of seizing with his teeth the manger, or other convenient object, and while holding it he endeavours to (according to Professor Williams) belch out air from his stomach.

“ A wind-sucker smacks his lips, gathers air into his mouth, extends his head, or presses it against some solid body, arches his neck, gathers his feet together, and undoubtedly swallows air, blowing himself out, sometimes to a tremendous extent ” (Williams).

The crib-biter, in time, generally wears away the outer edges of his centre and lateral incisors.

These habits, especially wind-sucking, cause impairment of the digestion, and consequently affect the general health and condition. They are both unsoundnesses.

Causes.—Idleness, indigestion, imitation, and irritation from teething.

Treatment.—Attend to the animal's general health, as directed under “ Indigestion.” The crib-biter may be fed from the ground, and all objects which he can grasp with his teeth may be removed from the stall; or they may be covered with some substance which he will not bite, such as that used for making iron wire

sieves, or rope made of coarse fibre. An admirable material, to be used for this purpose in India, is (as recommended to me by Mr. Anderson, V.S.R.A.) *moonj* rope covered with cow-dung. Or we may use, during the intervals between feeding-hours, a bar muzzle, which, while checking the vice, will allow the horse to eat his hay.

To prevent wind-sucking, a strap may be kept buckled round the neck, sufficiently loose to admit of food and water being readily swallowed, but tight enough to prevent the animal from swelling out his throat in his endeavours to gulp down air. For the same purpose, a strap with sharp spikes may be used. These appliances may be procured from any saddler.

Leaving a constant supply of water for the wind-sucker in his stall will often cure him of his peculiar vice.

CHAPTER XI.

DISEASES OF THE URINARY ORGANS.

RETENTION OF URINE — BLOODY URINE — DIABETES OR PROFUSE
STALING—INFLAMMATION OF THE BLADDER OR CYSTITIS—ALBU-
MINOUS URINE.

Retention of Urine.

THIS affection is generally caused by spasm of the neck of the bladder; by paralysis of the bladder; by the accumulation of hardened soapy matter in the sheath, owing to neglect of cleanliness; by the horse having been kept too long from staling, and by chill. It may also be due to the presence of calculi, and to other causes affecting the bladder and urethra. It may accompany colic and other diseases. Although in colic there may be retention, still when suffering from it, the animal does not make such frequent attempts to stale as he does when attacked by the ailment under consideration.

“The symptoms are frequent and ineffectual attempts to urinate; if standing, the animal will stretch itself out, strain violently, and groan with pain, discharging but a few drops of urine, or none at all. Examination *per rectum* will enable the practitioner to feel the distended bladder with the hand, and this distension of the bladder is the diagnostic symptom” (Williams).

Treatment.—Pass a catheter. If this instrument be not available, foment the loins, clothe warmly, give a pint of linseed oil, and after that the following ball :—

Opium	-	-	-	-	-	1½	drachm,
Camphor	-	-	-	-	-	2	drachm.

Repeat the ball, if after an hour or two the horse has not staled. When he has done so, give linseed mashes and linseed tea.

Bloody Urine.

The dark or bloody colour assumed by the urine is usually caused by improper feeding, or by strains received during violent exertion. I knew a steeple-chase horse that was always more or less affected in this manner after a race. Disease of the kidneys, irritation of the urinary passages, and the presence of calculi are also causes of bloody urine.

Treatment.—Put the horse on cooling food. Give linseed mashes, and substitute linseed tea for water as his drink. Give a mild dose of physic and two drachms of tincture of steel twice a day for a fortnight. In India a favourite native remedy is to fill a bucket half full with leaves of the *sissoo*, or *seesum* tree, pour water over them, rub the leaves together between the hands, and allow them to soak in the water for nine or ten hours; the fluid should be then strained off and given to the horse to drink. The mixture of a couple of handfuls of sugar, or *goor* (*Hindustanee*, molasses) will make this drink palatable to him. This mucilaginous fluid acts as an emollient in soothing irritation.

The *rationale* of the foregoing treatment is as follows: The purgative is given to allay inflammation existing in the urinary passages. The tincture of the terchloride of iron acts as an astringent in checking the flow of blood, while the linseed and sissoo are simply soothing demulcents.

If the urine be very dark-coloured without the presence of blood, we may generally conclude that this condition is due to the existence of a quantity of effete nitrogenous material in the urine, owing to too high feeding. The treatment should be a sharp aperient; cooling diet; half-an-ounce of nitre daily in the food or water; and linseed mashes at night. As nitrogenous matter is chiefly excreted from the kidneys, nitre is given to stimulate them.

Diabetes (Polyuria) or Profuse Staling.

Causes.—Improper food, such as musty hay and corn. Excessive use of diuretics. Feeding on boiled food for a considerable time (Williams). Diabetes may accompany indigestion and other disorders. Sometimes it appears before an attack of glanders. The saccharine form of diabetes (found in human practice) is unknown in the horse.

Symptoms.—Both the thirst and the amount staled is excessive. There is rapid loss of condition; the coat is rough, the taste vitiated, the gums pale, the urine watery, and general debility quickly ensues. The fæces are generally of a dark colour, and of a bad smell.

Treatment.—Give a mild dose of physic; change the

nature of the corn ; instead of water give the horse linseed tea to drink. Mix in the food or water half an ounce of the hyposulphite of soda, which, being a deodorizer, will tend to neutralise the foul smell arising from the injeſta, that, if abſorbed, might exerciſe a poiſonous influence on the ſystem ; and give, ſoon after feeding, in a ball, from one drachm, to one and a half drachm of iodine every day for ſix or ſeven days, exerciſing judgment in diminiſhing the iodine as the thirſt and amount ſtaled decreases.

Owing to the irritating effects of iodine on the ſtomach, it ſhould never be introduced into it when that organ is in an empty condition. The almoſt ſpecific (if I may uſe the term) action of iodine in this diſeaſe was firſt diſcovered by Prof. Dick. We may underſtand its effects if we remember that in ſmall doſes it acts as a tonic to the kidneys ; in fact, its action is ſpecially directed on the glands, to which organs the kidneys belong ; and, as explained by Neligan in his work on Medicines, “ under the continued uſe of ſmall doſes of this medicine, the removal or palliation of diſeaſe will ſometimes take place without any preceptible action on the ſystem generally. So far as I have obſerved, the depoſition of fat is conſequent on its adminiſtration in ſmall doſes ; the abſorbents are thus ſtimulated to moderately increased action, whereby food is more thoroughly aſſimilated, and the individual grows fat.”

Inflammation of the Bladder (Cystitis) and Strangury.

We may say that the only causes of this disease are the internal administration, or external application—as a blister—of cantharides, or croton; in both cases the active principles of these drugs become absorbed into the system. Fatal consequences frequently occur from blistering “all round.” In warm weather the urinary organs are more liable to become affected by blisters than when the temperature of the air is low. The chief reason for this is, I think, that in summer, owing to the increased action of the skin, less urine is secreted, and consequently the irritating matter, being less diluted, cannot be removed from the bladder as quickly as when the amount of urine is abundant, as in cold weather. Besides this, when the temperature of the air is high, the absorbents take up the active principle of the blister more rapidly.

Mares, at certain seasons, owing to sexual causes, are very liable to this affection from blisters.

Symptoms.—The lining membrane of the mouth—as indeed that of the whole intestinal canal—becomes red and inflamed. In the mare and horse, there is sexual excitement. “The urine is voided frequently, and with difficulty and pain, as it is irritating and burning; it is highly albuminous; the fæces are covered with mucus and mixed with blood” (Gamgee).

There is fever, pain, and excitement. If the symptoms be not alleviated, the disease will run a fatal course in two or three days.

Treatment.—If resulting from a blister, wash the

blistered part with warm water, having some carbonate of potash dissolved in it. Give the horse linseed tea to drink, and put him on bran mash. If he will eat, mix two ounces of the bicarbonate of soda in the food daily, or divide them between two or three drenches. Give the whites of a couple of dozen eggs now and then. Administer in a ball, two drachms of camphor twice a day.

Both the bicarbonate of soda and the linseed tea have a most soothing effect on the mucous membrane, while the sedative effects of camphor are most marked in cases of irritation of the urinary organs. In fact, we find that camphor given internally is excreted along with the urine, which seems to indicate that its medicinal effects are specially directed to these organs. The carbonate of potash forms a soap with the oily matter of any portion of the blister that may have remained on the part, and thus removes it. The white of egg is given as a soothing demulcent.

Albuminous Urine,

The existence of albumen in the urine arises generally from causes unconnected with actual disorder of the urinary organs, the removal of the cause being then the only treatment required. Albumen is often found in the urine after hard work; and also during fatty degeneration of the kidneys (Bright's disease), a very rare complaint among horses; the symptoms being stiffness in movement, and the continued practice by the horse of standing stretched out in his stall, as if he

were about to stale. In this disease treatment appears to be of no avail.

To test for albumen in the urine, add a few drops of nitric acid to neutralize the fluid (as albumen is soluble in an alkali), and then boil it; if albumen be present, a coagulum will be formed, which will remain unchanged on the addition of nitric acid, but will be dissolved by liquor ammoniæ. I may remark that, during life, the fluidity of the blood is dependent on its alkalinity; for were it to become acid or neutral, death would be the immediate result.

CHAPTER XII.

CONSTITUTIONAL DISEASES.

SIMPLE FEVER—INFLUENZA—EPIZOOTIC CELLULITIS OR PINK EYE—
CHARBONOUS FEVERS—PURPURA—LOODIANA FEVER—AZOTURIA—
RHEUMATISM—GLANDERS AND FARCY—MELANOSIS—WEED.

Simple Fever.

ALTHOUGH the existence of simple fever is not generally recognised in England, it is common in India and in other hot countries. The usual causes are exposure to the heat of the sun, imperfect ventilation of the stable during hot weather, and chill. High feeding and want of exercise are strong predisposing causes to this complaint. Well-bred horses resist the effects of the sun far better than those of coarser breed. This is well seen with the Australian horses we have in India. Dark-coloured horses stand the sun with much greater impunity than grey horses, the most susceptible of all being greys with pink skins. It may not be out of place if I remark that in tropical climates, during hot weather, there should be a free current of air through the stalls, and on no account should a dead wall be allowed to interfere with the free passage of air, under the mistaken idea that it keeps out the hot wind.

Symptoms.—Dulness; loss of appetite; skin hot and dry; pulse quick; and breathing accelerated.

Treatment.—Put on mash diet and green food. Have

free ventilation in the stable, or remove the animal to some airy situation, where he will be well protected from the rays of the sun. Sponge his coat over lightly with vinegar and water now and then. If there be great heat about the forehead and temples, put wet cloths over them. In India, if the weather be very sultry, employ a couple of men with large hand "punks" to keep the horse cool. If he be gross, and has been highly fed and little worked, give a dose of aloes in a ball, and half an ounce of nitre daily, for a few days, in his mash. But if the fever has not been induced by high feeding, give either of the following drenches in a bottle of water two or three times a day until the attack wears off:—

Sweet spirits of nitre	-	-	$\frac{1}{2}$ ounce,
Aromatic spirits of ammonia	-	-	$\frac{1}{2}$ „
Solution of acetate of ammonia	-	-	2 ounces.

Or—

Nitre	-	-	-	-	1 drachm,
Sweet spirits of nitre	-	-	-	-	$\frac{1}{2}$ ounce,
Carbonate of ammonia	-	-	-	-	$\frac{1}{2}$ drachm.

If these medicines be not procurable, give 1 ounce of nitre, or 3 ounces of Epsom salts daily in the food or water. The attack generally passes off in two or three days, and often leaves the animal much debilitated; when this is the case, feed him liberally, attend to his exercise, and give him a couple of quarts of beer a day, and a drachm of sulphate of iron in his food daily, or, if in India, a couple of ounces of chiretta.

Influenza.

Influenza is the convenient but unscientific term employed to denote an epidemic fever which occurs under various forms. At times, the pleuræ and lungs are the chief points of attack; on other occasions, symptoms of catarrh are best marked; while often the inflammation seems to be located in the cellular tissue of the body. Influenza is best distinguished by its epidemic character. We must regard it as a disease that has a certain but ill-defined course to run, so that our efforts may be directed not in vainly trying to cut short its course, but rather to smooth the way for the vital powers of the animal to overcome the poisonous effects which the epidemic exercises on the system. As the type of influenza constantly changes, I shall content myself by describing two usual forms, and by indicating their proper treatment.

“In uncomplicated cases the fever begins to abate in from three to four days, leaving the animal weak and prostrate” (Williams).

Influenza appears neither to be contagious nor infectious, but seems to be propagated by some poisonous matter contained in the atmosphere at the time. Its ravages are often very extensive. Bad sanitary conditions to a certain extent favour the spread of this disease. The first form we will consider is—

Pink Eye or Epizootic Cellulitis.

This epidemic receives its common name from the pink appearance assumed—when an animal is suffering from it—by the membrane (the conjunctiva) that lines the insides of the eyelids. It is considered by Professor Williams to be inflammation of the cellular tissue; hence the term cellulitis which he has given to it. We see this loose open tissue between the muscles and the skin on removing the latter from the body of any animal. It also surrounds the fibres of the muscles: thus the difference between the coarse and the fine grain of meat depends on the greater or less quantity in it of this cellular tissue.

This disease was very prevalent in Edinburgh during the months of January and February, 1877, and was ascribed, by Professor Williams, and by other experienced veterinary surgeons, to the saturation of the ground with water, owing to long-continued wet weather. In support of this theory, there is the significant fact that cases were, comparatively, very rare indeed in stables whose floors happened to be waterproof from being covered with cement.

The great danger to be dreaded in this disease is the formation of clots in the blood-vessels. In fact, we may often find a horse, when doing well to all appearance, die suddenly, the formation of a clot in the heart being the cause of death. I may here explain that in the living body healthy blood always remains fluid, but when removed it rapidly forms clots, which are caused by the coagulation of the fibrin which was previously held in a state of solution. This coagulation or clotting of

the fibrin may also take place in disease, the conditions that induce its occurrence being debility of the heart's action and an excess of fibrin in the blood. In this disease the action of the heart is extremely weak, while there is an excess of fibrin owing to the physiological fact that the seat of the disease is a fibrous tissue. I need hardly point out that our remedial means should be chiefly directed to prevent the formation of these clots.

During an epidemic, as might be supposed, influenza is generally much more prevalent and virulent in dirty, damp, ill-ventilated stables than in those enjoying good sanitary conditions.

Symptoms.—The symptoms vary in different epidemics, as well as in different periods of the same epidemic, and also in individual cases. There is always great debility; stiffness of the limbs and body at first, and a pink appearance of the insides of the eyelids. We generally find that the eyelids swell, and that there is a flow of tears from the eyes. The pulse is usually oppressed and very high. There is great dulness, in fact, the animal is generally in a more or less semi-unconscious state. There is usually constipation of the bowels, but those cases in which we have spontaneous diarrhoea or profuse staling, recover far more rapidly than the others. There is generally swelling of the limbs and joints; but when this appears the pain subsides. Sometimes there is great lameness, as if from inflammation of the feet. Occasionally cough and soreness of the throat are present. Sometimes symptoms of inflammation of the lungs appear. An attack is often preceded by colicky pains.

The fact of the pain subsiding on the appearance of swelling of the limbs, strongly supports the supposition that an inflammatory state of the cellular tissue which surrounds the fibres of the muscles is the cause of the great pain, and that the extreme stiffness arises from the natural disinclination the animal has to moving the muscles through which the inflamed tissue ramifies.

If properly treated this is by no means a fatal disease.

Treatment.—Reasoning from the fact already stated, that cases in which spontaneous diarrhœa or profuse staling appears rapidly recover, we may naturally conclude that the best plan of treatment is to promote these actions: hence if diarrhœa be not present, give—

Linseed oil	-	-	-	-	8 ounces,
Turpentine	-	-	-	-	1 ounce.

Subsequently give half the above dose every ten or twelve hours, and half an ounce of nitre in the food or water daily. If linseed oil be not available, give 3 drachms of aloes in a ball, and give the turpentine in a quart of gruel.

Or give $\frac{1}{2}$ pint linseed oil, followed by—

Carbonate of ammonia	-	-	-	-	2 scruples,
Nitre	.	-	-	-	$1\frac{1}{2}$ drachm,
Water	-	-	-	-	1 pint,

three times a day.

Either treatment may be continued for three or four days, or until the symptoms abate.

We should not be deterred from giving a laxative by the great existing debility, which will be relieved as soon as the bowels begin to act. This seems to indi-

cate that the debility is caused by the presence of some deleterious matter in the blood. As the bowels in this disease are very susceptible to the action of purgatives, we should consequently use them in small doses.

Let us now glance at the action of the medicines recommended. The turpentine is a diuretic and stimulant, but here it appears to act chiefly as an astringent on the walls of the blood-vessels. Its stimulating effect is most useful in combating the great debility. That the walls of the blood-vessels have, to a certain extent, lost their tonicity, is shown by the swelling of the eyelids and legs caused by the fluid part of the blood transuding through the walls. Both the carbonate of ammonia (a powerful diffusible stimulant) and the nitre (a diuretic) appear to have a well-marked action in retarding the coagulation of the blood, hence their use in preventing the formation of clots.

If there be soreness of the throat, neither give carbonate of ammonia nor turpentine, as either medicine would irritate the throat, and thus greatly distress the animal; but simply give $\frac{1}{2}$ pint of linseed oil as a drench, and mix $\frac{1}{2}$ oz. of nitre in the food or water daily.

Owing to the debilitated state of the animal, and to the danger of blood-clots being formed, aconite should on no account be given, as it is a sedative to the heart's action.

The horse should be put into a well-ventilated box, with plenty of warm clothing on; and should have as much water as he likes to drink.

At the commencement of the attack, the food should be of a laxative and cooling nature. If necessary, his

strength should be kept up by two or three quarts of ale or stout a day.

The second form of influenza to which we will direct our attention is what I shall, for convenience' sake, call—

Chest Influenza.

In it, sometimes, the symptoms of pleurisy are well marked, at other times those of bronchitis, with painful cough, running from the nose and eyes, and soreness of the throat. Often, from inflammation, the surface of the eyes assumes an opaque appearance. There is frequently swelling of the glands of the throat, and dropsical swellings of the legs, belly, and head. Often, when the difficulty of breathing is great, the horse is, from non-oxidation of blood, almost in a state of coma. Sometimes, when the animal is recovering from an attack, rheumatism sets in, or the liver becomes affected, as will be evinced by the yellow appearance of the gums and of the insides of the eyelids.

The treatment to be pursued should be of an alleviative nature aided by careful nursing, warm clothing, fresh air, plenty of water to drink, fomenting the sides, steaming the nostrils if there be a discharge, stimulating the throat if it be sore; or, if there be a cough, by giving half an ounce to an ounce of nitre in the water daily, while little or no more medicine should be employed. For further directions see Chapter IX.

N.B.—On no account give aconite, as it has a depressing effect on the system, due to its sedative action

on the heart, while this epidemic is accompanied by extreme debility.

Charbonous Fevers.

Charbonous fevers are epidemics of a certain virulent type, which are accompanied by grave alterations of the blood; they occur in various forms, and are similar to typhus fever in man. The blood assumes a dark colour, it loses its coagulability, and becomes rapidly decomposed. "Chemically it has been determined that there is a diminution of two-thirds of the fibrine-composing materials, and an augmentation of the red colouring matter" (Williams). This blood, apparently from its increased fluidity, oozes through the walls of the blood-vessels, causing swellings about the legs, throat, abdomen, &c. The disease is called in French *charbon* (coal), from the dark colour given by this black-looking blood to the tissues into which it infiltrates. On account of this exudation of blood in a perverted state, dark red patches of extravasated blood (called "petechial spots") often appear on the mucous membranes of the mouth and nostrils; and tumours may make their appearance in the loose tissue beneath the skin at various parts. Whatever the position of these tumours may be, they are "symptoms of the same disease. They are critical eruptions due to preservative, eliminatory power, to expel from the organism what is morbid and injurious" (Williams). There is always high fever, heat of the body, and more or less insensibility and coma, usually preceded by excitement, the

coma being due to the pressure of the effusion on the brain. There is often a yellowish bloody discharge from the nostrils. The lining membrane of the eyelids is frequently yellow and congested. Dulness and colicky pains often herald the attack.

Charbon is a most fatal disease, and usually runs its course in from six to forty-eight hours.

"All the ancient authors, and, with few exceptions, all modern authors, are unanimous in admitting that charbonous diseases are virulent, and susceptible of being transmitted not only between individuals of the same species, but from one species to another" (Williams).

Causes.—"The causes of charbon are arranged by French veterinary writers under four principal heads, comprising respectively the influences of temperature; water spread over the surface of the earth, as in morasses and stagnant ditches; forage tainted with decomposing animal and vegetable matters; and contagion" (Williams). To the above list I may also add foul emanations from decomposing urine and dung in neglected stables.

It seems probable that charbon is propagated by *bacteria*.

Having given a brief outline of the general nature of charbon, I shall content myself with noticing two principal varieties, namely, that met with in England—*purpura hæmorrhagica*—and that found in India, which is commonly called *Loodiana fever*.

Purpura Hæmorrhagica—English Charbon.

The following account of this form of charbon, which appears in England, was kindly placed at my disposal by Mr. A. Johnston, Professor of Materia Medica at the New Veterinary College, Edinburgh.

Symptoms.—The first symptoms are prominent swellings of about the size of a florin, usually on the inside of the thighs, and petechial spots on the mucous membranes of the mouth and nostrils. The bowels are generally constipated, and the fæces are usually covered with mucus and blood. The prominences on the legs soon coalesce, causing swellings of the extremities, which terminate abruptly on the thighs or fore-arms. The lips and nostrils then swell, the distension here also terminating abruptly at any part of the head. The eyelids generally swell. There is a thin, gluey, bloody discharge from the nostrils; this, accompanied by swelling of the throat and head, often renders tracheotomy imperative. The horse can usually swallow well. There are swellings of the sheath, belly, and breast, which generally terminate on the same level as that of the legs. The fluid now, from the giving way of the vessels, begins to ooze through the skin, and is more or less mixed with blood. Death occurs from gravitation of the fluid into the lung-tissue, and from debility.

The horse begins to become comatose as soon as the general swelling commences to appear, and he becomes more and more insensible to outward impression as the attack advances.

Treatment.—If the sanitary conditions of the stable be bad, remove at once, if possible, to a healthy, well-ventilated box. Give two or three times a day—

Oil of turpentine	-	-	-	1 ounce,
Linseed oil	-	-	-	4 ounces.

The turpentine seems to act as an astringent to the walls of the blood-vessels, thus improving their tonicity, and probably thereby checking the transudation. It may tend to arrest the morbid change which the blood undergoes during this disease. It also acts as a stimulant and slight diuretic. The great prostration present indicates the use of a stimulant; while increasing the action of the kidneys seems to be beneficial in removing deleterious matter from the blood. The oil is simply used as a vehicle for the turpentine. In default of oil use gruel. From the outset, the strength should be supported by giving gruel, stout, or ale, &c.

Professor Williams advises that from a half to one ounce of chlorate of potash should be given at first, and then an ounce every twenty-four hours. "It must, however, be remembered that extravasations depend more upon the condition of the blood than upon the blood-vessels, and remedies which are calculated, either by their antiseptic or oxidizing properties, to alter the abnormally fluid tendency of the blood, are better calculated to attain the object than those which merely act upon an effect of the disease. For this reason the chlorate of potash has been prescribed, and with marked results. Whether this salt acts as a direct antidote to the septic [blood] poison or not, is a matter which I cannot explain. It is a fact that blood, when drawn from an

animal suffering from purpura, or from one in a state of health, has its coagulating properties much increased when a small quantity of this salt is added to it" (Williams). He advises the use of linseed oil for keeping the bowels relaxed, and small doses of sweet spirits of nitre, which acts as a stimulant and also as a diuretic.

Give the animal plenty of cold water to drink, and, if constipation be present, administer enemas of warm water. Allow the horse gruel to drink, and any green-meet he may like to eat. Keep him warmly clothed. To support his strength nothing is better than two or three quarts of stout a day. Tracheotomy may have to be performed.

On no account puncture the swellings.

Loodiana Fever—Indian Charbon.

This form of charbon is known among the natives of Northern India as *gutheea*, or *bhogónah*.

Mr. Knott, V.S.R.A., in the *Veterinary Journal* for January, 1877, describes the symptoms so clearly that I shall take the liberty of making the following extract from his report:—

“*Symptoms.*—This disease assumes more than one form, and is in some cases more malignant than in others. I shall first notice the severe form:—The patient is found to be dull, off feed, with marked prostration; pulse quick and weak, varying from 80 to 90, and sometimes 100 per minute (in many cases, however, it is imperceptible), mouth and skin very hot, very quickened res-

piration ; visible mucous membranes of a bilious tinge, and injected, sometimes with petechiæ upon them, similar to *Purpura Hæmorrhagica* ; breath very foetid and hot, throat sore and deglutition difficult ; bowels, as a rule, constipated, fæces sometimes clay-coloured and covered with mucus, having the appearance of boiled vermicelli ; and in some cases both colicky pains and *Diarrhœa* are present ; there is great swelling of the head and neck, which in the greater number of cases extends down to the sternum, and consequently causes laborious breathing. These are the dangerous symptoms ; and the animal usually drops down dead from suffocation. Sometimes from the eyes and nostrils a yellow discharge exudes, which has the appearance of thickened serum. In some cases, prior to death the animal becomes mad, rushes round his stall and makes attempts to jump out, and finally drops down dead—a proof that the brain is affected.

“*Milder Form.*—All the symptoms of fever are present ; but not the severe throat symptoms and swelling of the head and neck, as in the other cases : these, however, often run into the severe type.”

For further information on this disease I refer my reader to Mr. Knott's report, and also to an able and exhaustive one by Mr. Poyser, V.S., “*The Carabiniers*,” which appeared in the *Veterinary Journal* for December, 1876.

Mr. Poyser states that “the temperature in the rectum runs from 104° to 111° F.”

As to its being infectious, Mr. Poyser remarks :—“In the evidence it is shown as most probable that infection was in operation. Teams, and horses always

stabled closely together, and worked and even exercised together, were more attacked than detachment horses which were not so intimately connected." Mr. Knott writes, "I am inclined to believe that it is highly infectious."

"Experience shows that the incubatory period is probably limited to ten or twelve days" (Poyser).

Considering the infectious nature of charbon, and the supposed causes that induce it, the greatest attention should be paid to sanitary measures. The horses should be removed, if possible, to some dry, healthy position, the whole of the animals among whom the outbreak occurred should be segregated, while there should be a further division between the sick and apparently healthy ones. The water should be changed, and the forage carefully selected. Before the horses return to their stables or lines, their abodes should be thoroughly disinfected; the walls should be scraped and afterwards whitewashed; the floors or standing-places dug up, and the soil to the depth of a couple of feet should be removed; some disinfectant, such as a solution of sulphate of iron in water—1 lb. to 1 gallon—should be poured over the place, and then fresh earth filled in. Crude carbolic acid might be smeared over all the wood and iron work. If the water be suspected, sink a new well.

Respecting this disease, Mr. Knott (*Veterinary Journal*, May, 1877) observes that the contagion "generally remains in a place from which suffering horses have been taken. I remember one occasion on which horses were brought back by mistake, and picketed in the lines where the first symptoms of the disease had shown themselves, and although they had been away

for a month or five weeks, three or four of them, shortly after their return, sickened, and had the fever very badly; they eventually recovered, however, owing to the mildness of the throat symptoms. Their lines had not been disinfected, nor had the old earth been picked up and carted away—presumably showing that the contagion still remained in the old soil.”

Treatment. Treat as for purpura hæmorrhagica.

Azoturia (*Nitrogenous Urine*).

This disease was first noticed by Mr. Haycock, and was called by him Hysteria, as he imagined that it was peculiar to mares, and that it was due to excitement from sexual causes. Professor Williams, however, has pointed out that horses and geldings are also affected by it, and that it is caused by the presence of a large amount of effete nitrogenous matter in the blood, which poisons the system, and that it is induced by high feeding and want of exercise. When it occurs, it almost always, if not invariably, appears after exercise subsequent on a few days' rest.

The presence of a large amount of urea ($C_2H_2N_4O_2$) in the urine may be shown by adding nitric acid to it, when a precipitate consisting of nitrate of urea will be formed. There is also generally, but not always, albumen in the urine during an attack of this disease; the albumen will be precipitated by the nitric acid as well as the urea, but the precipitate of the former is dis-

solvable in weak ammonia, while that of the latter will be unaffected by it.

Symptoms.—The appearance of an animal suffering from this disease is most characteristic. The muscles over the quarters (the gluteal) are violently contracted, which gives the horse a goose-rumped look. One hind limb is advanced in front of the other, and on attempting to put weight upon it, the hind quarters will drop until the hocks almost touch the ground. The animal is bathed in perspiration, and is in such agony that he will seize anything with his teeth, and not unfrequently will tear the affected side, or its fore-arm. The urine is very dark-coloured, and is usually copious, but the horse is unable to void it. (For the foregoing details of the symptoms of azoturia I am indebted to the kindness of Prof. A. Johnston, M.R.C.V.S.) The high colour of the urine is due to the presence of urea, and of other effete materials. The paralysis is probably owing to irritation of the spinal cord, caused by an excessive quantity of deleterious matter in the blood.

Treatment.—The proper treatment is removal of the exciting cause; hence give a full dose of aloes. Place the horse in a large well-ventilated box, and give him plenty of water to drink. If he can stand in slings, place him in them; in some cases, however, he will be quite unable to support himself at all with his hind legs, and consequently would fall back in the slings, which, if they can be employed, are advisable, because if the animal lies down he, being very restless in this disease, will knock himself about, and by doing so he will greatly increase the fever and excitement. If the pain be very extreme (but not otherwise), give a couple of ounces of

tincture of opium ; and if the pulse be very high and full, take away three or four quarts of blood. Foment the loins and quarters with warm water, and clothe the animal warmly in order to encourage the skin to act.

The urine should be drawn off by means of a catheter, from time to time.

On the next and following days, give ounce doses of sweet spirits of nitre, mixed in cold water, three times a day. If there be constipation, give a pint of linseed oil.

In this disease, symptoms should not be treated by giving astringents to check the dark-coloured urine ; on no account should mustard plasters be put on the loins or quarters, as the irritation caused by them greatly augments the fever. At first the food should be light and laxative. As there is great subsequent debility, the strength should then be kept up by liberal feeding. A drachm of sulphate of iron may be mixed through the food daily, and the horse may get a couple of quarts of beer a day.

After a severe attack, the animal rarely recovers the use of the affected limb, while deaths are more frequent than cures.

Rheumatism

Is "an inflammation of the fibrous structure of the joints, tendons, ligaments, or of the heart and closed cavities, and thecæ [sheaths] of muscles, due to a specific condition of the blood, and accompanied by fever, stiffness, and lameness. The inflammation is metastatic or erratic in its character, disappearing from one part of the body to reappear in another, without any

appreciable cause" (Williams). On account of the inflammation there is almost always heat and swelling, with considerable pain in the affected parts—which are generally the joints or muscles—and lameness. The lameness usually precedes the swelling. When rheumatism attacks the tendons, the inflammation may easily be mistaken for sprain. Here the history of the case must guide us in our diagnosis. The great characteristic of rheumatism is the manner in which it flies from one part to another. In the acute form there is high fever, with a hard, quick pulse. In chronic rheumatism, fever is seldom present, while the inflammation is less intense but more lasting, causing the horse to become stiff in his action. Chronic rheumatism is a most serious disorder, as it leads to structural alterations in the bones, joints, and other parts of the body.

Exciting Causes.—Exposure to cold and wet. A peculiar state of the system, which renders the animal predisposed to this disease. Rheumatism may follow other inflammatory attacks, especially chest epidemics.

The practice of washing horses is very apt to bring on rheumatism. In some localities this complaint is much more prevalent than in others. The drier the climate, the greater the immunity appears to be.

The disease itself seems to be occasioned by the presence of some morbid material in the blood.

Treatment.—Accepting the cause of this affection to be that which has just been stated, we find that the most successful treatment is one which best tends to eliminate the morbid material from the system; hence give a moderate dose of physic, followed by $\frac{1}{2}$ -ounce doses of nitre in the food daily for a week. Give from 1 to $1\frac{1}{2}$

drachm of iodide of potassium in a pint of water, twice a day as a drench, till the symptoms disappear, or until this medicine affects the animal's appetite. Wherever inflammation appears, apply a smart cantharides blister, of course taking care that the surface blistered at one time be not too extensive. Keep the animal warmly clothed and stabled. Give him plenty of water to drink, and restrict him to green and laxative food.

"According to Dr. Herbert Davies, physician to the London Hospital, the action of blisters, by promoting a serous discharge from the blistered surface, affords a ready means of exit to the rheumatic virus" (Williams).

Following out this idea, we give physic and laxative food to move the intestinal canal, nitre to act on the kidneys, iodide of potassium to stimulate the glands, and we apply warmth and clothing to encourage excretion from the skin.

Glanders and Farcy

Are two forms of the same fatal and contagious disease.

"The discharge from the nose of a glandered horse, when introduced into the systems of other horses, may in one produce glanders, and in another farcy, whilst the pus from a farcy ulcer may produce in the inoculated animal glanders, farcy, or both; and the common termination of farcy, if a horse affected by it be allowed to live a sufficient length of time, is glanders, and of glanders, farcy. Such an animal is described as being 'both glandered and farcied'" (Williams).

This disease may be propagated by infection, or by inoculation; or may be spontaneously developed in the healthy animal from defective sanitary arrangements. Cases have occurred on board ship, in which a number of horses have been attacked by glanders and farcy from being battened down, and thereby kept in a poisonous atmosphere for a few hours during rough weather.

Owing to defective stable management, this disease was formerly very common in England, but now it is fortunately rare.

Both glanders and farcy are respectively divided into the acute and chronic forms, according as their development is rapid or slow. Chronic farcy is held to be curable in some cases, but I would strongly advise the owner to get rid of the affected animal at once, for though he may recover for the time being, he will almost certainly have a relapse, while the disease will gain strength with each succeeding attack.

The virus of glanders is readily communicable from the horse to man and other animals, and *vice versa*.

Symptoms of Glanders.—Glanders is characterized by a continuous discharge, which generally issues from one nostril only, or more rarely from both; it has the appearance of the white of egg, or of boiled starch; it is sticky, and dries round the edge of the nostrils, while that of nasal gleet has a yellowish-white, creamy look. The lining membrane of the nostrils, instead of being of a healthy red colour, is at first pale, or leaden coloured, and subsequently assumes a purple or coppery hue. In the acute form this membrane becomes ulcerated.

“The ulcers are characteristic, being excavated, as if cut with a punch, but after a time they become ragged at their edges, irregular, enlarged in all directions, and confluent. The spaces between the ulcers are covered with pimples, which soon ulcerate” (Williams). These chancrous-looking sores are often absent in the chronic form. The discharge is accompanied by swelling of the gland or glands in the hollow between the jaws of the affected side or sides. This characteristic swelling “is known by its isolated character, by its distinctly being the only tumour present, the skin being drawn tensely over it, and the surrounding space being perfectly clear from any tumefaction; lastly, by its close and immovable adherence to the side of the jaw against which it lies. Should there be disease in both chambers of the nose, we shall have tumefied glands on both sides, though it will rarely happen that both sets of glands will swell at one and the same time” (Percivall). These tumours are the result of sympathy with the irritation existing in the nasal passages.

As pointed out by Percivall, in distinguishing glanders from catarrh, the absence of cough or soreness of the throat will strengthen our suspicion of the existence of the former disease.

Fever and constitutional disturbance precede the appearance of acute glanders; while the approach of the chronic form is extremely insidious.

Symptoms of Farcy.—Small hard tumours break out on the surface of the body, usually on the insides of the thighs and fore-arms, or on the neck. In the acute form there is fever, and swelling of the affected limbs. “The swellings, which are called buds, due to inflam-

mation of the glands and valves, point and burst, giving exit to a purulent material. These buds are generally found in groups, and "away from the articulations" (Williams). In the chronic form the swellings may continue indolent for a long time, while their appearance may have been preceded by little or no constitutional disturbance.

Development.—As treatment is practically of no avail, our efforts, in case of doubt, should be directed to the speedy development of the disease—if it be present—on account of the danger there is to man and beast in keeping an affected animal.

To accomplish this object give for two or three days, fifteen grains a day of the bichromate of potash; this will cause the disease, if existing in the system, to assume a virulent and well-marked appearance. A dose of physic will also develop it, but I cannot advise any one to run the risk of introducing his hand into the mouth of a glandered horse.

The employment of the bichromate of potash, for hastening the development of glanders and farcy, was first proposed by Professor A. Johnston, New Veterinary College, Edinburgh.

Melanosis

Is a magligant growth which occurs in various parts of the body, and is due to the deposition of pigmentary matter. It appears outwardly in the form of tumours, which gradually increase in size, and are usually on the lower, and sometimes on the upper surface of the tail, about the anus, sheath, and crest. I have observed in one or two cases that its first symptom was a wavy look of the tail, caused by slight melanotic eminences among the hairs, which gradually dropped out as the disease progressed. In India the crest is often affected, in which case the hairs more or less fall out. Melanosis is almost entirely confined to grey horses, appearing usually after the ninth or tenth year, when the coat begins to turn white. It is much more common in India than it is in England, perhaps because the proportion of grey horses to those of a darker hue is much greater in the former than in the latter country. This difference may also be due to the greater effect light has in India than in England, on the pigmentary granules of the pigment-cells. When existing to any extent, melanosis is a disgusting disease; it is not alone an eyesore, but also, from interference with the internal organs, may permanently injure the horse's health, or prove fatal to him; besides this, the irritation caused by these tumours affects the animal's condition. The tumours will often, especially if they be subjected to friction, burst, and form unhealthy-looking abscesses, which discharge a dark-coloured fluid.

The treatment can only be palliative. The malignant

growths may be excised, or burnt out, but they will appear assuredly reappear.

N.B.—A non-malignant tumour is always confined to the same tissue in which it first occurs, as in the skin, for instance, while the malignant form may either simultaneously, or consecutively in different tissues.

Weed (Swelled Leg) or Lymphangitis

Is inflammation of the glands of the leg. It is generally confined to one hind leg. The attack is preceded by a shivering fit or cold stage, hence the common name "shake." This, as in ague, is followed by a hot stage, with high fever, quick, full pulse, and great pain. The glands at the groin, or at the elbow (as may occur in some few instances), swell, and this swelling extends downwards to the foot. The hot stage is terminated by sweats breaking out over the body. The inflamed lymphatic vessels of the leg, which look like enlarged veins, appear clearly defined when the swelling subsides, hence the term "weed," from their supposed appearance to a vegetable growth.

The cause of this disease is irritation to the lymphatics, said to be caused by an excess of fibrin in the blood. It is generally induced by over-feeding and neglect of regular exercise. It usually occurs after a day or two's idleness, hence its name, "Monday morning disease." After repeated attacks, the leg becomes permanently enlarged, owing to the organization of previous exudations.

Treatment.—In the inflammatory stage, give a dose of physic, and apply warm fomentations to the part. Bleed to the extent of about a gallon, or give 10 drops of aconite in a pint of water once or twice as the pulse may indicate. During the intervals in which the leg is not fomented, keep it smeared over with the extract of belladonna, made up with a little gum. Keep the animal on laxative food, and give after the first day an ounce of sweet spirits of nitre in a pint of water two or three times a day; and after that, mix three quarters of an ounce of nitre in his food daily for a week. The affected leg should neither be blistered nor fired. The best means for reducing its size is hand-rubbing, and the pressure afforded by an elastic or flannel bandage. On no account work the animal until all inflammatory symptoms have subsided. After an attack, great care should be observed as to the feeding and exercise of the horse, as this disease has a marked tendency to recur, and by doing so to cause a permanent thickening of the limb—an incurable condition termed elephantiasis.

CHAPTER XIII.

DISEASES OF THE LIVER.

CONGESTION AND INFLAMMATION OF THE LIVER—JAUNDICE—CHRONIC
INFLAMMATION OF THE LIVER.

Acute Disease of the Liver.

As it is most difficult to distinguish the various diseases of the liver of the horse* one from another in the living animal, and as they are very rare in England, and have consequently been but little studied, I cannot see, with our present state of knowledge, the use of following human physicians in their minute divisions of these affections. By symptoms alone we are unable to distinguish between congestion and inflammation of this organ, so for all practical purposes it will suffice if we divide these diseases under two broad headings, viz., acute and chronic, including congestion and inflammation of the liver under the former. Of course we are not here concerned with *post-mortem* examinations, as long as they afford us no information which we can utilize for the benefit of the horse while he is alive. As jaundice is but a symptom of derangement of this gland, we shall not specially allude to its treatment.

Causes.—The usual causes are—high feeding ; want of

exercise ; and exposure to heat, particularly if it be succeeded by cold. These affections are very common in India, especially in the northern parts of that country during the commencement of the cold weather which follows the hot season and rains. During the two last-mentioned divisions of the year, many horses become predisposed to inflammatory attacks of the liver, chiefly, I think, because the action of the skin is so much in excess to that of the lungs. "Want of exercise and heat diminish the respiratory functions, and causes that of the liver to be disordered ; and the result is enlargement of the organ from accumulation of fat" (Bennett). When deprived of the stimulus afforded by active exercise, the internal organs become to a greater or less degree gorged with non-aerated blood, and consequently more liable to disease than they would be were the circulation assisted by the movement of the muscles. Now when the cold weather commences, the days still continue hot, but the nights become chilly. The native grooms, who are generally but ill provided with garments, often remove the horses' clothing for their own use as bedding. It is easy then to conceive how these animals get derangement of the liver ; for the cold, acting on the surface of the body, contracts the superficial vessels, and determines the blood on to the internal organs. Besides this, cold appears to have an effect on the nervous system in influencing the circulation. Now it stands to reason that the organ which is in the worst state of health will be the first to suffer from a sudden access of blood. Hence we find that in cases of chill the liver of the horse is particularly liable to disease in the hot, dry climate of India ; while the lungs, pleuræ, or bron-

chial tubes are more exposed to attack in the cold, damp climate of Great Britain.

Symptoms.—Yellowness of the mucous membranes. Clay colour and foetid smell of the fæces, which are sometimes mixed with coffee-coloured patches. There will be a sour smell from the mouth. Loss of appetite ; constipation ; urine high-coloured from the colouring matter of the bile being excreted with the urine. There will be dulness and depression, accompanied at first with some fever. The horse may evince on pressure the presence of pain in the region of his liver. In some cases there is lameness of the off fore-leg.

Pathology.—The liver is a gland whose chief office is to secrete bile. It is composed of a great number of small *lobules*, while the bile-cells form their mass. Each lobule is complete in itself, having blood-vessels both for its functional purposes and for its own nutrition, as well as bile-tubes for conveying away this secretion.

These tubes are lined with a mucous membrane, which in a state of health constantly secretes mucus to lubricate these passages. Surrounding this membrane there is a coat of involuntary muscular fibre, which urges, by its contraction, the bile and mucus forwards. These tubes lead into larger ones, and finally the bile is discharged through one common duct—which also conveys the pancreatic juice—into the small intestine close to the stomach, and mingles with the semi-prepared food (the chyme) which has just quitted that organ. The chief office of the bile is to act as a natural purgative, and also as an antiseptic in check-

ing decomposition of the food. Hence when it is absent the bowels become constipated, and the fæces emit an offensive odour; they also assume a clay colour from absence of the colouring matter of the bile. During irregularity in the discharge of this secretion, parts of the fæces are often here and there of a coffee colour, which is owing to an altered condition of the bile. This secretion assists the pancreatic juice in forming an emulsion with the fat contained in the chyme. These fluids being alkaline, a soap is formed in which the oily particles are split up into a very fine state of division. This minute separation of the fat gives the chyme (now called *chyle*) its white appearance, in the same manner as it does in the case of milk, the object of the minute division of the fat being to facilitate its absorption.

Congestion of the liver is rare in England, but is not uncommon in hot countries. It is induced by want of exercise, high feeding, and heat. The vessels of the liver become over-filled with blood, and, as at the outset of every inflammation the function of the attacked organ is stimulated, an increased supply of bile is secreted. The liver now swells considerably, the bile-tubes become blocked up, owing to pressure and to the inflamed state of their mucous linings, and the whole gland becomes gorged with bile; while little or none, as shown by the clay colour of the dung, is discharged. The bile, thus obstructed, is in part absorbed by the blood, and is taken into the general circulation, thereby giving to the various tissues the characteristic tinge of jaundice by means of its colouring matter (biliverdin), and is finally, for the most part, excreted by the kidneys, and in a lesser degree by the skin (Bennett).

In health, this colouring matter, which is derived from the blood (Bennett), unites with the bile acids that are prepared in the liver, and with other matters to form bile, which is carried into the intestines, and eliminated.

When the liver becomes inactive, neither are the bile acids formed, nor is the colouring matter removed from the blood; hence we have the tissues in this case also tinged with yellow, or a condition that is called “jaundice from non-elimination.”

From the foregoing remarks we may learn that in congestion or inflammation of the liver we have the following conditions:—1. The veins and arteries of the gland are distended with blood. 2. The liver itself is gorged with bile, which is unable to obtain exit on account of the blocking up of the ducts. 3. The blood is loaded with bile, whose presence produces symptoms of fever and depression. 4. Owing to the absence of this secretion in the intestines they become constipated, and the food becomes quickly decomposed, which causes the absorption of deleterious gases from the injesta before they are finally expelled.

Principles of Treatment.—The use of calomel, aloes, or other liver stimulants, should be avoided, for by increasing the secretion of bile it would but add to the mischief.

To relieve the congestion of the vessels of the gland, we may employ means to draw the blood to other organs, and to diminish its volume. A purgative will accomplish both objects, for by irritating the intestines it will cause a quantity of blood to be determined to them, producing, in fact, temporary congestion of their

vessels ; while it will also occasion the evacuation of a quantity of the watery constituents of the blood. A moderate bleeding, say four or five quarts, might be tried ; but I cannot advise its employment, because these affections are accompanied with considerable depression and debility, owing, seemingly, to the noxious presence of bile in the blood. A purgative is, I think, much preferable in such cases, for its effect is less weakening to the system, and besides it purifies the blood of deleterious matter dissolved in the watery portion which becomes discharged. The purgative will also relieve the fourth condition I have mentioned, viz., constipation, thus preventing the absorption of deleterious gases from the injeſta prior to their evacuation. The aperient I recommend is the sulphate of magnesia (Epsom ſalts). Its action ſhould be aſſiſted by keeping the horſe on laxative food, ſuch as bran maſhes, roots, and green fodder. Two or three enemas of water (100° F.) to clear out the rectum might be adminiſtered.

As the kidneys and ſkin are the organs which excrete the bile that is abſorbed into the blood, we may with great advantage ſtimulate them. Here I would adviſe the uſe of nitre (a diuretic), or of ſweet ſpirits of nitre (a diuretic, diaphoretic, and ſtimulant), warm fomentations over the region of the liver (the right ſide), and warm clothing.

To aid in overcoming the great debility, as well as to act on the kidneys and ſkin, the employment of the ſweet ſpirits of nitre is, I think, ſpecially indicated.

Care ſhould be taken to allow the animal a plentiful

supply of fresh water, in order to maintain the normal fluidity of the blood.

While we have thus endeavoured to reduce the congestion of the vessels of the liver, to remove the bile which has been absorbed into the blood, and temporarily to overcome the constipation of the bowels, we have in ipecacuanha a valuable agent for relieving the obstruction to the flow of bile into the intestine, for restoring the gland to its healthy function, for mitigating the congestion, and for allaying the fever by its sedative properties.

Were I the originator of the idea of using this drug for the objects just stated, I should indeed be diffident in advocating its employment in this manner in veterinary practice, now for the first time, I believe, in print. The circumstances which led to my forming the conclusions which I now put forward are as follows.

In the autumn of 1875 in India I was advised to try ipecacuanha by Mr. Kettlewell, V.S. Bengal studs, in the case of a race-horse I had which was suffering from an acute attack of congestion of the liver. The animal presented the usual symptoms of great depression, yellowness of the mucous membranes, and clay colour of the fæces. After two or three days following the exhibition of the ipecacuanha these conditions rapidly disappeared, and a speedy restoration to health was the result. During the racing season of 1875-6 in India I suggested the use of this drug in several cases of congestion of the liver, and always with marked success, its good effects after a few doses being clearly shown by the improved colour of the mucous membranes and fæces, indicating rather the removal of obstruction to the flow

of bile into the intestines than increase of the secretion. Ipecacuanha appears to act by stimulating involuntary muscular fibre, and thus relieves congestion of the blood-vessels of the liver by causing their muscular coats to contract, which tends to drive the blood forwards; while in the same manner the obstruction of the bile-ducts is relieved, and the secretion is allowed to flow into the intestines. The action of this drug here is very similar to that which it has in relieving the distressing symptoms of bronchitis in the human subject; for when the mucous membrane of the bronchial tubes is dry and inflamed, it alleviates the congestion of the blood-vessels and causes a healthy secretion of mucus from the glands; while if the bronchial tubes are blocked up by mucus, it stimulates their muscular coats to expel it. In human practice it is in such cases called an *expectorant*, but as regards the horse we may more correctly term it a *deobstruent*. That a horse does not spit up phlegm in the same marked manner as a man does is no proof that expectorants do not act in his case, for the phlegm probably gets dislodged all the same, but instead of being spat out, it may fall into the gullet, and thence pass into the stomach, or drop slowly from the nostrils or mouth.

Sir Robert Christison was, I believe, the first to remark on the action which ipecacuanha has on the liver.

Treatment.—Agreeably to the foregoing remarks we may give, on one or more occasions, as a drench—

Sulphate of magnesia	-	-	8 oz.
Water	-	-	3 pints,
Treacle	-	-	quant. suff.

Give $1\frac{1}{2}$ drachm of ipecacuanha in the form of a ball twice a day for a week, or, if the mucous membranes recover their healthy and normal hue, its use may be discontinued before that time. Administer, as a drench, an ounce of sweet spirits of nitre in a pint of cold water, two or three times a day. The sulphate of magnesia and sweet spirits of nitre may be given as the symptoms seem to indicate. An enema of warm water (100° F.) may be administered from time to time if the constipation continues.

Apply warm fomentations over the liver on the right side. Keep the horse warmly clothed and stabled. Allow him bran mash, roots, green fodder, and plenty of water to drink. A little gentle exercise—say a walk for a mile or two, once or twice a day—may be given at discretion.

We have seen that jaundice may occur in two ways; first, by bile being absorbed into the blood; and secondly, by inaction of the liver, in which condition it does not eliminate the colouring matter of the bile from the blood. In the first case, the bile acids that are formed in the liver when the function of that organ is unimpaired, although the bile itself fails to get access into the intestines, are to be found in the urine; but in the latter case they are absent. The presence of these acids may be tested for, but the experiment is a delicate one, and cannot be entirely relied upon, so I am reluctantly obliged to content myself with the broad general treatment I have given without distinguishing between symptoms of "obstruction" and "non-elimination of bile." Dr. Bennett, in his Clinical Lectures, remarks: "To me it has not appeared, from numerous trials, that

any amount of skill and experience will ever enable the physician to come to a conclusion on this point, when all that has to be determined is the difference between a rich brown and a purple colour—constantly passing as they do into one another—in order to distinguish the absence or presence of an acid, on which depends a conclusion so important." The test is as follows:—Take some of the urine in a test-tube, add a little loaf sugar; when this has dissolved, pour in a small quantity of sulphuric acid, which being heavier than urine, will sink to the bottom of the tube. If the biliary acids be present, a purple line will mark the point of contact of the acid and urine, but if they be absent, the line will be of a reddish brown.

Chronic Disease of the Liver

May be induced by poor and insufficient food, in which case this organ shares in the general wasting of the tissues; or, as we usually find, particularly in India, by too high feeding and want of exercise, in which case the animal will usually have suffered from acute attacks on previous occasions.

These diseases are rather obscure in their nature. The cases that I have seen in India presented but few characteristic symptoms to guide the observer. There was always depression of spirits; loss of appetite for corn, although the animal would eat plentifully of greenmeat of every sort; and wasting of the muscles, which was very visible over the hind quarters. There was generally some constipation, the dung lighter coloured than usual, and the mucous membranes pale and tinged

with yellow: The coat did not seem to be affected. I have found that in these cases the animal got considerably better on a course of green fodder, roots, and regular though moderate exercise, with now and then a few drachms of aloes; but that if he was put on "hard" food, he would rapidly lose the little condition he had "put on," while the mucous membranes would become yellow, and the mouth would acquire a sour smell. I must say that I have never seen a radical cure effected in a case of a horse suffering from chronic disease of the liver in India—a remark that very generally applies to human patients with the same complaint who remain in that country. From observing the good effects obtained with sal ammoniac in human practice, Dr. Young of Edinburgh, a short time ago, recommended me to try a course of it with horses in 2 drachm doses three times a day. It is a good stimulant, and is valuable in causing the absorption of effusions; to this latter action is its value in chronic disease of the liver ascribed. Its power of causing absorption is well seen if we apply a little of it dissolved in water on a black eye in which case it will rapidly aid in the removal of the extravasated blood. The sal ammoniac may be given as a drench in a pint of water. In India I would advise that an ounce of powdered chiretta be also given twice a day and mixed in the animal's food. It is an admirable bitter, and seems to have valuable alterative properties. An "alterative" medicine is one that has certain beneficial though ill-understood effects on the system. A biniodide of mercury blister might be applied over the region of the liver, with the object of causing absorption.

In human practice dilute nitro-muriatic acid has been used with great benefit. It might be tried with our patients in doses of $1\frac{1}{2}$ drachm given in a quart of water twice a day. It seems to promote a healthy action of the liver.

CHAPTER XIV.

NERVOUS DISEASES.

CONGESTION OF THE SPINAL CORD OR KUMREE—TETANUS OR LOCK-JAW—STRINGHALT.

Congestion of the Spinal Cord or Kumree.

THIS is not an uncommon disease in many parts of India, where it is known as *Kumree*, which is derived from the Persian word *kumr* signifying the loins. It also occurs in Burmah, the Mauritius, and, I am informed, on the West Coast of Africa. Its development seems to be particularly favoured by a damp relaxing climate, very different from the dry condition of the air which is peculiarly suitable to the general health of the horse.

The all but universal idea in India is that this paralysis is caused by some sudden chill, due to atmospheric influence; hence the common expression, "a stroke of the wind." I need hardly say that the baneful effects of chill, particularly in warm climates, whether as influencing the animal or human economy, are far greater when the air is laden with moisture than when it is dry, because under the former condition the evaporation of perspiration is checked, sweat bedews

the body, and the superficial blood-vessels become congested. If while in this state the animal be exposed to a cold wind, the shock to the nervous system and the rush of blood to the underlying tissues may readily cause congestion of the blood-vessels of the spinal cord, and consequent paralysis, owing to the pressure on the nerve fibres due to the dilatation of these vessels. From the effects of chill we have in England now and then instances of paralysis due to congestion of the spinal cord, with symptoms identical to those of kumree. Unfortunately we know little or nothing of the pathology of this latter complaint. Mr. Poyser states, "Of the morbid anatomy of kumree we literally know no more than we do of its remote or proximate causes.

"The spinal cord and its meninges [covering membranes] are the parts in which grave lesions have been observed after variable periods of illness; but how far or in what manner they are physically affected immediately after the attack we are never likely to know, though a thorough investigation made—if the patient were killed—at this time might bring to light conditions in parts where we do not expect to find them, and of which we have no idea." (*Veterinary Journal*, November, 1876.)

Respecting the districts of India in which this disease is to be found, General Ryves, late of the Bengal Cavalry, remarks: "I mention the disease, not from much hope of being able to assist in its cure, but as one prevalent in some parts of India, especially in damp localities. In the districts of Chumparun and Tirhoot, where the water is near the surface and east winds prevail, and I believe in many parts of Bengal, it is very common"

("Veterinary Aide Mémoire"). The climate of Bengal is very moist and hot, and is consequently very unsuitable for horses.

When stationed some years ago on the south-west coast of India—a part of the peninsula which possesses an extremely moist, hot, and consequently oppressive climate—I observed several instances of this disease, the cases occurring chiefly among Arab entire horses. The disease was supposed to be connected with the chilly land-wind which, from time to time, blew off the Western Ghauts.

General Ryves writes: "Prevention is better than cure, and the best is good stable management and guarding horses from exposure to cold winds and rain, and from a sudden chill by being stripped for cleaning while heated. Syces [native grooms] when in camp and marching are very careless on these points; they frequently march an animal with all its clothing, head and heel ropes, &c., piled on, and when they arrive at the end of their march, they are prone to at once strip them, leaving them to stand ungroomed, while they dawdle about and smoke their hookahs." In the same work Mr. Phillips, V.S. R.A., observes: "Horses brought out of their stalls and standing in the open, exposed to any wind, washed from head to foot by their syces, is a frequent cause of this disease. By the time the syce has finished washing the horse, the first part washed has been dried by the wind, and so on. In this way the horse is chilled.

"Also from being trotted out during the heat of the day, and suddenly made to halt and stand for half an hour or more, exposed to the sun's rays." I commend

these practical remarks to the attention of horse-owners in India.

The theory has been more than once started that kumree is caused by the eating of ergotised grain, and not by climatic influences. On a subject like this, which has been so imperfectly studied, I am most diffident in offering any opinion beyond stating that the indigenous ponies in India enjoy an extraordinary immunity from this disease. In fact, I have always understood that in many districts on the southern slope of the Himalayas, as Cachar for instance, foreign horses, such as Australians, cannot be kept, owing to their susceptibility to kumree, which the hill ponies nearly always escape. I mention this more to open up inquiry than to support any theory. If it can be proved that native ponies, or horses, in districts in which kumree is prevalent, enjoy a far greater freedom from its attacks than do Arabs and Australians—both being natives of a dry climate—under the same dietetic and sanitary conditions, then the ergotised grain theory must fall to the ground.

Again, the whole train of symptoms of poisoning by ergotised grain is at utter variance to the sudden attack, without premonitory warning, of kumree.

The action of the poison of ergotised grain is specially evinced by impairment of the general health, which may be followed by grave derangements of the system, paralysis among the rest. Now nothing of this sort occurs in cases of kumree which appear here and there among numbers of horses living under the same dietetic conditions, as in batteries of artillery and in regiments of cavalry. Were the poison derived from ergotised grain we might

expect that the general health of several would be seriously affected, and that paralysis might ensue in some few cases. But on the contrary, the attack in individual cases is sudden and unexpected, and the health of the other horses is not specially affected. The horse may have finished his gallop on the race-course strong and well, or may have carried his master on parade with all his wonted fire and light-heartedness, and yet in half an hour after arriving at his stable he will be paralyzed and helpless, without having shown any premonitory symptoms of constitutional disturbance; in fact, the attack comes on in the same sudden manner as acute rheumatism does when caused by chill.

If we admit the truth of the ergotised grain theory, I submit that even then the probability is that the poison acts by causing congestion of the vessels of the spinal cord; and if this be the case, the proper treatment will be identical to that indicated in cases induced by chill. Thus the principles of treatment will be the same whichever theory we accept. Respecting congestion, Dr. Bennett, in his Clinical Lectures, observes, "In the same manner are explained all the varied phenomena of hysteria and spinal irritation, for inasmuch as the spinal cord furnishes, directly or indirectly, nerves to every organ of the body, so congestion of this or that portion of it may increase, pervert, or diminish the functions of the nerves it gives off, and the organs which they supply. Congestion, therefore, we conceive to be the chief cause of functional nervous disorders originating in the great cerebro-spinal centre."

For further information on the subject of kumree.

see Mr. Poyser's paper, to which I have before referred. I learn from the Bengal Stud Records that kumree is not hereditary; therefore an entire horse, paralysed to but a slight extent, may be used for stud purposes; a mare similarly so affected will rarely be able to bear the weight of the stallion.

Symptoms.—The attack seems always to come on suddenly, and irrespectively of the health and condition of the animal. In serious cases he "drags" his hind legs, and progresses with difficulty. In mild forms, when led, he may walk and trot fairly well, but if a person attempts to mount him, or if pressure is applied over the loins, the affection will at once become apparent, for he will then either sink down behind, or show more or less marked symptoms of loss of power in the loins. Even when led, the presence of the disease will be at once noticed if the animal be made to back, or if he be turned sharply round.

The disease, if allowed to run on, generally assumes a chronic form. The horse may recover sufficiently for light harness work, or continue quite useless. In the latter case he often gets gradually worse, and dies after some time.

"I have never seen anything approaching a perfect cure of a case of bad kumree; and even in slight cases, and where the animal has been partially patched up after much time and trouble, it is unsafe and comparatively helpless, and of little value" (Ryves). These remarks entirely coincide with my own experience.

Treatment during the First Stage.—The treatment generally pursued in India, has been, on the whole, eminently unsuccessful, as might be inferred, if we

accept the congestion of the spinal cord theory; the means employed being blistering and firing the loins, and the internal administration of strychnine. Let us for a moment consider the condition of the parts suffering from spinal congestion. The vessels are gorged with blood, while the pressure on the nerve fibres caused by this congestion produces the paralysis. Here the rational treatment is, I submit, removal of the cause. If we fire or blister along the spinal cord, we shall determine an increased supply of blood to the already over-distended vessels, thereby adding fuel to fire; the same action is brought about by the exhibition of nux vomica, or strychnine, its active principle, for the action of this drug seems to be peculiarly directed to paralysed structures in increasing the supply of blood to them.

A sharp purgative is indicated, for by irritating the bowels it causes a large quantity of blood to be determined to them, thereby relieving the congestion of the spinal cord. It also diminishes the volume of the blood-mass by depriving it of a considerable portion of its watery constituents. The use of belladonna is also specially indicated, its action being to relieve congestion by causing contraction of the involuntary muscular coats of the blood-vessels. Mr. Finlay Dunn, in his work on Veterinary Medicines, thus describes its properties:—"Belladonna is a direct stimulant of the sympathetic nervous system. It hence increases the number and force of the heart's beats. It gives tone to dilated and congested capillaries. In the web of the frog's foot it has been seen to contract the ramifications of the arteries often to less than three-fourths of their former calibre, inducing such increased movements of

the red globules, that about twice the former quantity of blood passed along them (Meuriot and Harley)."

The use of the carbonate of ammonia would appear to be called for, because it strengthens the action of the heart, and tends to preserve the fluidity of the blood—two influences that are directly opposed to a state of congestion.

Warm fomentations would be most beneficial, for their special influence is to soothe local irritation, chiefly it is supposed by assisting the swelling of the part, which relieves the nerve fibres of pressure.

Laxative food, warm clothing, plenty of water to drink, and pure air are specially demanded, in order to preserve the purity and fluidity of the blood.

From the foregoing observations I think we may safely adopt the following procedure during the first stage of this disease, viz., to give a sharp purgative and to administer a drachm of extract of belladonna in a ball three times the first day, and twice a day after that; and a drachm of carbonate of ammonia three times a day in cold water or cold gruel as a drench, as hot fluids are liable to decompose it. As the extract of belladonna is apt to deteriorate, especially in hot climates, we might, in cases of doubt, use its active principle, atropine, which possesses all the good qualities of the drug. Mr. Finlay Dunn states that the sulphate of atropine is the most stable and convenient form. It may be given in doses of one grain. Apply continued warm fomentations over the loins for several days, and at night cover them with sheepskins which have been just taken off the freshly slaughtered animals: if they be not procurable, place a folded blanket, which has been dipped

into and wrung out of hot water, over the loins, and cover it with some waterproof material, so that it may act as a continued poultice. Above all things do not allow the animal to get chilled while these fomentations are being persevered with. The legs should also be fomented with warm water, well hand-rubbed and warmly bandaged. Hand-rub the surface of the body, and keep the animal comfortably clothed. Give bran and linseed mashes, roots, and green fodder.

If the animal can stand fairly well, slings may be of use, for it is quite possible that the local congestion may be increased by the recumbent position. If the paralysis be considerable, slings should not be employed, as the consequent pressure on the abdomen would interfere with digestion. The practitioner should exercise his own judgment on this point.

If the animal is unable to stretch himself out in order to void his urine, the catheter should be passed five or six times a day.

Treatment of the Second Stage.—A fortnight after the primary attack, we may consider that the first or inflammatory stage has passed, and that, if paralysis still continues, it is due to the pressure of the exudation which has transuded through the walls of the inflamed blood-vessels, and which consists of lymph (liquor sanguinis)—the colourless and fluid portion of the blood. Congestion, if it be very temporary, may pass off without any exudation occurring, but if it continues, lymph will exude through the walls of the blood-vessels, and we shall have inflammation of the part. In fact, congestion is but the first stage of inflammation. The swelling that we observe in inflamed tissues is due to this exudation of lymph.

Now in this second stage, our object should be to remove this exudation which presses on the nerve fibres and causes paralysis. In fact, the process of inflammation here is identical to that which results from sprains. (See Chap. I.) Hence our endeavours should be directed to encourage the reparative action of nature, by determining an increased supply of blood to the part for the absorption, or breaking up of this exudate. With this end in view, we may give a drachm each of *nux vomica* and of iodide of potassium twice a day, gradually increasing the former to two drachms. The latter is tasteless, so may be given in the water, while the horse will readily eat the *nux vomica* if mixed in his food. I prefer it to its alkaloid strychnine on account of its stomachic properties in improving the appetite. It should be discontinued as soon as any nervous twitchings make their appearance in the muscles of the animal, or when his appetite begins to fail.

For cases of poisoning by *nux vomica*, or by its alkaloid strychnine, the best antidote we possess is the active principle of tobacco, *nicotina*. We may employ it as follows:—boil $\frac{1}{2}$ lb. of strong tobacco in a quart of water for a minute or two; and give half a pint of the decoction mixed in a pint and a half of cold water as a dose. Or administer 10 minims of *nicotina* in a pint of water. In case of an over-dose of tobacco; give drenches of half of a pint of spirits in a pint of water.

The iodide of potassium is given to encourage the absorption of the exudate.

Keep up the strength with liberal feeding, and give half a drachm of sulphate of iron twice a day in the food.

Blister along the spinal cord, over the loins, and down to the tail with—

Biniodide of mercury -	-	-	1 part,
Lard -	-	-	16 parts,

and keep up the irritation by rubbing in a little of this ointment from time to time. The object of this is to encourage an increased supply of blood to the part for the removal of the exudate. If this fails, fire deeply on both sides of the spinal vertebræ, over the loins down to the root of the tail.

I prefer the biniodide of mercury to cantharides in this case as a blister, as its effect is less irritating to the horse, and it is not apt, like the Spanish flies, to cause derangement of the urinary organs. Besides this, it seems to encourage the process of absorption.

I believe that the French veterinary surgeons, in the island of Mauritius, recommend that the operation of docking should be performed immediately after an attack.

I may mention as an interesting physiological point, that the first step in the change of muscular tissue suffering from paralysis, is the obliteration of its transverse striæ; in fact, it begins to assume the character of fibrous tissue.

I submit the foregoing method of treatment for trial in cases of kumree, though I have not been able to put it to a practical test, simply because I did not "think the matter out" until after my return to England. The method is a sound one for the treatment of congestion of the spinal cord.

Tetanus or Lockjaw

Is continued contraction of the voluntary muscles (Bennett). It may be the result of an injury, or may come on without any assignable cause. In the former case it is called traumatic, in the latter idiopathic tetanus. Authorities are divided in opinion as to which is the most serious form, although I think the weight of evidence inclines to the former.

Tetanus is a most fatal disease. It runs its course in from one to six weeks. "There are some cases of tetanus so acute from their commencement that it is quite hopeless to expect any but a fatal termination; and in every case where all the symptoms are firmly established before the fourth day of attack, death may be expected. But in cases where the symptoms are slowly developed, some movement of the jaws still remaining, the exacerbations not very severe—more especially if the animal possess a calm quiet temper, and lives over the ninth day,—a recovery may be expected" (Williams). Little or nothing is known regarding the morbid condition of the nervous system which produces this disease.

Symptoms.—The muscles that are usually affected by the continued spasm, are those of the jaws, neck, and back; hence we have the mouth closed, the nose poked out, the head elevated, the neck "ewed," the back hollowed out, and the tail raised. There is great stiffness and rigidity of the body. The eyes are sunk, and the haws partly drawn over them. The animal

looks nervous and terrified. The nostrils are dilated, and the flanks tucked up. These symptoms generally come on gradually. Although there is continued cramp of the muscles, still the patient suffers from aggravated spasms from time to time, the slightest noise or excitement being often sufficient to bring them on. The bowels are constipated, and there is often retention of urine, from the horse being unable to stretch himself out.

Treatment.—Place the animal in slings as soon as possible. "I recommend the slings because many horses which are in a fair way of recovery lie or fall down when the muscles begin to relax, and, when down, struggle and fight to such an extent that they seldom recover from the excitement and renewed severity of the disease thus brought on. The surroundings of the patient are of the utmost importance; the stable must be darkened; should contain no other horses; be situated in a quiet spot, removed from noises, and the door must have a lock, the key of which is to be kept by one individual (the veterinary surgeon, if possible), who is to visit the patient, at most twice a-day, and great care must be taken that the animal is not tormented by flies" (Williams). Beyond following these excellent directions little can be done towards alleviating the disease. The most successful medicinal treatment consists in giving a strong physic ball, say from eight to ten drachms of aloes, if it can be administered without unduly exciting the animal, while four drachms of extract of belladonna may be given in a day as a sedative. It may be placed at the time of the spasms between the animal's molar teeth, and then

allowed to gradually dissolve. He should have a plentiful supply of nutritious gruel, milk and eggs, &c. Owing to the long continuance of this disease, medicines are of little use, perfect quietude being the chief consideration. If a wound has been the exciting cause, apply warm fomentations to it.

Stringhalt

Is a convulsive spasm of the muscles which flex the leg. The foot is picked up with a peculiar snatch. In mild cases it may be observable only when the horse begins to move, or from time to time as he progresses ; but in bad cases it may be perceived at every step he takes. It is almost always confined to the hind legs, sometimes affecting both of them. This disease almost invariably gets worse with age. I think slight cases of stringhalt are more readily seen in the horse's stall on turning him round from side to side than when he is taken outside. The causes of this complaint are obscure, though they are undoubtedly due to pressure on the nerves which supply the affected limbs. It is quite incurable, although, if aggravated by hard work or by injury, the symptoms may be relieved by the usual means, such as rest, physic, warm fomentations, &c. It is principally found among cart-horses, and is an unsoundness.

Notes on Veterinary Materia Medica.

Alkalies or Antacids.

Bicarbonate of Soda (Baking Soda).—Is useful in acidity of the stomach, by neutralizing the acid which may be present in that organ. In such cases the relief afforded by alkalies is but “temporary and palliative, as they do not correct that peculiar state of the digestive organs which causes the formation of acid” (Neligan). It allays, in a marked manner, irritation of the mucous membrane of the intestinal canal, and is consequently useful in laminitis when attended with irritability. *Dose*, 1 oz. twice a day.

Chalk (Carbonate of Lime).—Prepared chalk is a valuable antacid in diarrhoea; it also forms a mechanical protection for the mucous membrane of the intestines. *Dose*, 1 oz.

Lime (Oxide of Calcium).—1 part soluble in 1,500 parts of water. This solution (lime water) is beneficial for foals suffering from a deficiency of bone-forming material, and in diarrhoea when acidity of the bowels is present. It may be given in $\frac{1}{4}$ -pint doses three times a day.

** Carron Oil.*

Lime water	-	-	-	} equal parts.
Linseed oil	-	-	-	

Application for scalds and burns.

Alteratives.

Arsenic.—Is an alterative and tonic. Its good effects are well marked in skin diseases. See page 182. If long continued its action becomes cumulative, and it tends to corrode the coats of the stomach and intestines. Symptoms of arsenical poisoning are swelling of the eyelids, flowing of tears, &c. Its best *antidote* is freshly prepared sesquioxide of iron, to be given in doses of from 15 to 20 times the amount of arsenic taken. *Dose*, 5 to 10 grains. Arsenic is most conveniently given in the form of

Liquor Arsenicalis.

Arsenic	-	-	-	-	-	1 part,
Carbonate of soda	-	-	-	-	-	1 „
Water	-	-	-	-	-	96 parts.

Boil together until the arsenic is dissolved. Each ounce of this solution contains 5 grains of arsenic. Fowler's solution, which is used in human practice, contains 4 grains to the ounce.

Chlorate of Potash.—It lowers the pulse and temperature (see page 233), and improves the general tone of the digestive organs. *Dose*, 1 oz. a day. A saturated solution in water is a useful gargle for sore throat.

Iodine.—For its action in diabetes, see page 218.

Iodine Ointment.

Iodine	-	-	-	-	-	1 part,
Lard	-	-	-	-	-	8 parts.

Useful in cases of parasitic ringworm.

Application for Indurated Glands.

Iodine	-	-	2 drachms,
Oil of turpentine			1 oz.
White liniment	1	.,	(Prof. A. Johnston).

Combine the first two ingredients, and afterwards mix in the liniment. Here we have hydriodic acid formed. White liniment is formed by mixing equal quantities of water and olive oil with the aid of a sufficiency of the subcarbonate of potash to make a soap.

Iodide of Potassium.—Stimulates the glands. *Dose*, 3 or 4 drachms two or three times a day. It increases the solubility of iodine.

Salt.—Common salt is the most valuable alterative we possess. It is an essential article of food. If an animal be deprived of it, his coat will become rough and staring, and the action of his digestive organs impaired. A horse should be allowed about two ounces of salt daily in his food. "It is thought to be the natural stimulant of the digestive system in all animals; to become decomposed, and afford chlorine for the hydrochloric acid of the gastric juice, and sodium for the bile; to perform some important functions in regard to the blood discs; and to assist the blood in maintaining its 'fluidity, its stimulating properties, and its powers of self-preservation'" (Finlay Dunn).

Tartar Emetic.—Seems to stimulate the glands of the skin, and consequently improves its appearance. *Dose*, 1 drachm twice a day in the food for a week or ten days.

Anthelmintics (Worm Medicines)

Are medicines that are used to destroy or to remove worms that may be in the intestines. See page 211.

Camphor.—In default of tartar emetic or turpentine we may use camphor, in doses of 2 drachms twice a day, dissolved in alcohol.

Tartar Emetic.—See page 211.

Turpentine, Oil of.—See page 212.

Aperients and Laxatives.

Barbadoes Aloes is the usual purgative employed in veterinary practice. It is the dried juice of the leaves of the aloe plant, grown in the West Indian islands. There are several other varieties of aloes, but their actions are not as certain as that of the species we are considering.

Characters.—The best is of a liver-brown colour, dull fracture, and of a dull yellow appearance when reduced into powder—an operation that is accomplished with some difficulty, but which may be overcome by adding a few drops of ether. It is completely soluble in boiling water.

Composition.—It is composed of its active principle, aloine, mixed with certain resins and other substances.

Actions.—In small doses it appears to act as a tonic or alterative in improving the general health of the animal; in full doses it is a purgative, acting sometimes as a diuretic. Externally it is used as an application to wounds.

It is rapidly absorbed into the system, and seems to

be excreted into the large intestines, thereby increasing their vermicular motion.

It usually takes from eighteen to twenty-four hours to produce a purgative effect.

As aloes appears to be a liver stimulant, one should be very careful in giving it in cases of liver diseases.

Doses.—As a tonic or alterative, from 1 to 2 drachms may be given ; as a purgative, from 3 to 10 drachms.

The action of this drug is influenced by the breed and individual peculiarity of the patient, by the country in which he lives, by the nature of the food which he eats, by the condition of his stomach at the time he takes the physic, by his state of health, and by the nature and quantity of the food and drink which he partakes of after getting the physic. Hence, as a rule, the cart-horse can take a very large dose with impunity, while a small one will move the thorough-bred.

Some horses, especially slack-loined, "washy" animals, are very easily purged. In Scotland, horses require about one and a half times the amount of aloes that they do in the south of England, or in Ireland. This, I believe, is owing to the large amount of woody fibre contained in the hay made in the first-mentioned country. My experience in India is that horses there are very amenable to the action of aloes. Animals fed chiefly on corn are more difficult to purge than are those which are kept on grass and other green food. When restricted to bran mash, the bowels are readily acted upon. If aloes be given on an empty stomach, its effects will be far more severe than if that organ were in a full condition. Drinking cold water increases the purgative action of this drug.

When there is irritation of the intestinal canal—which may be manifested by the presence of mucus among the fæces—and generally if there be existing any acute affection of the chest or air-passages, purgation is easily excited by a moderate dose of aloes. Hence its use is contra-indicated during the conditions just mentioned.

For an ordinary horse, such as a hunter or trooper, $4\frac{1}{2}$ or 5 drachms will usually be sufficient as a purgative; while 6 drachms may be given to the cart-horse. In Scotland the latter may safely get an ounce. In India I have usually found 4 to $4\frac{1}{2}$ drachms quite enough for an ordinary animal.

Modes of Administration.—In almost all cases I would advise that it should be given in a ball instead of in a drench, for if the latter method be adopted a considerable portion of the resins contained in the drug will, on cooling, adhere to the sides of the vessel in which the aloes is dissolved, and become consequently lost. I may remark that their presence appears to materially assist the action of the active principle aloine. Besides this, in drenching there is danger of a part of the fluid getting spilt, and if this occurs it will be impossible to tell how much escapes. In the solid state, aloes is nearly, if not quite, as rapidly absorbed as it is when in a fluid condition, while there can be no uncertainty as to the quantity given.

If a physic ball does not act in a day or two, a second one should on no account be given for at least a week, else fatal super-purgation may ensue. The same rule should be observed if a ball breaks in a horse's mouth. It is a true observation that the longer aloes takes to act, the more danger is there of super-purgation.

Preparation :—Alterative Ball.

Barbadoes aloes	-	-	-	1½	drachm,
Tartar emetic	-	-	-	1	„
Nitre	-	-	-	3	drachms,
Treacle or lard, sufficient to form a ball.					

Physic Ball.

Barbadoes aloes	-	-	-	5	drachms,
Ginger	-	-	-	2	„
Treacle or lard, sufficient to form a ball.					

But if required for immediate use, a ball may be made up by simply adding a little water to the powdered aloes.

Physic Mass.

(Used at the New Veterinary College, Edinburgh.)

Barbadoes aloes	-	-	-	3	lbs.
Ginger	-	-	-	¾	lb.
Olive oil	-	-	-	¾	„
Treacle	-	-	-	¼	„
Spirits of wine	-	-	-	¼	„

4½ lbs.

For every drachm of aloes take 1½ drachm of this mass.

The compound tincture of aloes is a most useful application for abraded surfaces.

Management of the Horse before and after giving Physic.

—For at least a day before the physic is administered the animal should be restricted to bran mashes and hay while the allowance of the latter should be somewhat restricted on the last night. “The physic is given on an

empty stomach, early in the morning ; immediately afterwards a bran mash is given ; that over, the horse goes to exercise, for perhaps an hour, and is watered when he returns. The water should be as warm as he will take it, and he should have as much as he pleases throughout the day ; bran mash should be given as often as corn usually is, and better warm than cold ; if both are refused, bran may be tried, but no corn, and but little hay. Sometimes gentle exercise may be given in the afternoon, and also next day. The physic usually begins to operate next morning, though it rarely takes effect in twelve hours, frequently not for thirty. When the physic begins to operate, the horse should stand in the stable till it *setts*, which may be twelve hours" (Dick).

Bran.—Is a laxative when used as a mash, but when employed dry it seems to have a constipating effect.

To make a Bran Mash.—Scald a stable bucket with boiling water, then put into it about 3 lbs. of bran, with an ounce of salt, and add as much boiling water as the bran will take up, which will be about an amount equal in weight to the bran itself, calculating the gallon of water to weigh 10 lbs. The mash should then be well covered up, so as to keep the steam in ; and it should be left to stand thus till it gets cool enough for use, which will be in about from a quarter of an hour to twenty minutes.

Epsom Salts (Sulphate of Magnesia).—Is a useful laxative in fevers, chest affections, and in derangements of the liver ; but as a purgative for the horse its action is uncertain. It may be used when the fæces are hard, clay-

coloured—indicating suppression of bile,—and covered with mucus, or when they are in a slimy state, both of which latter conditions manifest irritation of the intestinal canal. In such cases aloes is generally inadmissible, owing to its drastic nature.

The Epsom salts may be given daily in doses of 4 oz. in the food, or 8 oz. for one dose as a drench.

Linseed.—Cold-drawn linseed oil is the most valuable laxative we possess in cases in which it is necessary to avoid irritating the mucous membrane of the intestines, as in laminitis, diarrhoea, influenza, &c.

It may be given in doses of from 1 to 1½ pint. It forms the best vehicle for the administration of oil of turpentine. In small doses it allays irritation of the mucous membranes generally, and appears to be particularly beneficial in diseases of the urinary organs. Its good effects on the skin are well marked, these being probably due to the deposition of fat in the areolar tissue below the skin. May be used, with these objects in view, in doses of 2 oz. mixed in the food three times a day. Or better still, the linseed may be given every night for some time in the form of a bran and linseed mash, which may be made by boiling 1½ lb. of linseed for two or three hours, until it becomes transformed into a mucilaginous mass. Then mix in about 2 lbs. of bran, taking care to have the linseed thin enough to soak it up. Add an ounce or two of salt, cover the mash well up, and allow it to stand till it becomes cool enough for use.

Linseed Tea.—May be made by boiling a small quantity of linseed in a full supply of water.

Astringents.

Alum.—Soluble in 18 parts of cold water. It coagulates albumen, hence its astringent effect. Dissolved in water it forms a useful astringent lotion for wounds.

Burnt Alum.—See “Thrush.”

Calomel.—See “Thrush.”

Carbolic Acid.—1 to 80 of water forms a good astringent lotion for wounds. Its effects are not so strong when it is mixed with glycerine or oil as when combined with water; with either of the first two in the proportion of 1 to 20, it may be used for cracked heels, &c.

Catechu.—Good for checking diarrhoea. It possesses a very astringent taste. “Good samples are sweet, and free from bitterness and grittiness” (Finlay Dunn).
Dose, 2 drachms.

The action of the Indian variety, called *Kuth* in Hindustanee, is weaker than that used in English practice.

Oxide of Zinc.—May be used in powder as an astringent for sores; or in the form of ointment (1 to 8 of lead) as an application for cracked heels, &c.

Subacetate of Lead.

Solution of the subacetate of lead.

(In imitation of Goulard's Extract.)

“Acetate of lead	-	-	-	5 ounces,
Oxide of lead (litharge) in powder				3½ „
Distilled water	-			1 pint, or a sufficiency.

Boil the acetate and oxide of lead in the water for half an hour, constantly stirring; then filter, and when the liquid is cold add to it more distilled water until the

product measures twenty fluid ounces. Keep the clear solution in well-stoppered bottles " (Tuson).

As an application for cracked heels, &c., use 1 part of the solution to 4 parts of glycerine, olive oil, or cream.

Sulphate of Zinc.—2 to 4 drachms dissolved in a pint of water form a useful astringent lotion for wounds, &c,

White Lotion.

Sulphate of zinc -	-	} Of each 2 drachms.
Acetate of lead -	-	
Water -	-	1 pint.

Tannin.

Styptic Colloid.

Collodion -	-	10 oz.,
Carbolic acid -	-	1 „
Tannin -	-	$\frac{1}{2}$ „ Dissolve (Tuson).

This is an admirable application for abraded surfaces.

Tincture of Steel (Tincture of the perchloride of Iron).—Internally it appears to act as an astringent to the walls of the blood-vessels, hence its use in bloody urine, charbon, &c. In such cases it may be given in drachm doses three times a day. For diarrhoea, give in 3-drachm doses twice a day, combined with an ounce of the tincture of opium. Externally, for stopping bleeding, use 1 part to 8 parts of water.

Turpentine.—May be given in one-ounce doses two or three times a day. It acts as an astringent on the walls of the blood-vessels. See "*Purpura hæmorrhagica*."

Blisters and Rubefacients.

Ammonia.—S. G. '850, used in making stimulating applications.

Soap Liniment.

Soap	-	-	-	-	2 oz.,
Strong liquor ammoniæ	-	-	-	-	1 „
Water	-	-	-	-	4 pints.

Boil the water and dissolve the soap in it. When cold add the ammonia.

Stimulating Liniment.

Soap liniment	-	-	-	$\frac{1}{2}$ pint,
Strong liquor ammoniæ	-	-	-	1 to 2 drachms.

Biniqdide of Mercury.

Biniodide of mercury ointment.

Biniodide of mercury	-	-	-	1 part,
Lard	-	-	-	8 to 32 parts.

Cantharides.

Blistering ointment.

“ Cantharides in powder	-	-	1 oz.,
Prepared lard	-	-	6 „

Digest the cantharides and lard together over a water-bath for three hours, with occasional stirring; while hot filter through paper, and allow the clear liquid to cool” (Tuson).

Caustics.

Acetic Acid.—Used for removing warts on delicate parts.

Arsenic.—Used for “ coring.”—See page 54.

Bluestone (Sulphate of Copper).

Carbolic Acid.—Used in “ grease” and “ bursatee.”

Caustic Potash.

Corrosive Sublimate.—See page 54.

Nitrate of Silver.

Disinfectants.

Carbolic Acid.—The crude acid may be applied to iron and woodwork in cases of infectious diseases. “Buildings may be disinfected, and the atmosphere impregnated with the acid by steeping rags in it and then suspending them in various parts of the room, stable, &c.” (Tuson). Mixed with from forty to eighty parts of water it is useful for disinfecting drains, &c. As recommended by Dr. Voelcker, sawdust may be soaked in as much of a solution of equal quantities of the acid and water as it will take up, and then may be set aside for use. A handful of this carbolized sawdust (sprinkled here and there in a stable now and then) will tend to keep it free from foul emanations.

Sulphate of Iron.—A solution of 1 lb. to the gallon of water is an admirable disinfectant for stables. When brought into the presence of ammonia and sulphuretted hydrogen, the ammonia becomes fixed by being converted into the sulphate; while the sulphuretted hydrogen is decomposed by yielding up its sulphur to the iron.

Sulphur.—In the form of sulphurous acid is valuable for fumigating a building. The doors and windows should be closed, and four or five (or as the case may be) shovelfuls of burning coals placed inside it in convenient positions. On each shovelful of coals about $\frac{1}{4}$ lb. of sulphur should be thrown; and the fumes of the sulphurous acid should be allowed to fill the building for a few hours.

Diuretics.

Nitre (Nitrate of Potash).—From $\frac{1}{2}$ to 1 oz. may be given in the food during the day. See pages 172 and 173.

Fever Draught.

Nitre	-	-	-	-	-	1 dr.
Sweet spirits of nitre	-	-	-	-	-	$\frac{1}{2}$ oz.
Carbonate of ammonia	-	-	-	-	-	$\frac{1}{2}$ dr.
Water	-	-	-	-	-	1 pint.

May be given three times a day.

Sweet Spirits of Nitre (Nitrous Spirit of Ether).—
Dose, 1 to 2 oz.

Insecticides.

Carbolic Acid, a solution of 1 part to 40 of water.

Corrosive Sublimate.—See page 37.

Kerosine Oil.—See page 37.

Poultices.

For applying poultices to the feet, a poultice-shoe, constructed as follows, may be used with great advantage. Take a circular piece of hard wood, a little longer and broader than a horseshoe, and about $1\frac{1}{2}$ inch thick, and get one surface of it rounded in a lathe, so that there may be a rise of about $\frac{3}{4}$ inch in the centre, while the other surface remains flat. Round the circumference of the board have leather nailed, so as to form a convenient boot for retaining the poultice, and similar to the one in ordinary use, except that the part which comes on the ground is rounded. The fact of its being round will enable

the horse, to whose foot it is applied, to ease the affected spot by throwing weight on to the toe, or on the heel, or on either quarter. I need hardly say that this idea is but a modification of the principle applied by Mr. Broad, of Bath, to shoes for the cure of laminitis.

The best poultices for general use are those made with turnips, carrots, or linseed meal. Bran, though light and convenient, dries very quickly.

To make a poultice with carrots or turnips, it is only necessary to boil a convenient amount of these roots, and then mash them up. The common country carrots of India form an excellent poultice for cracked heels, &c., where an astringent action is required, as they contain a large amount of tannin.

Linseed Meal Poultice.

" Linseed meal	-	-	-	4 ounces,
Olive oil	-	-	-	$\frac{1}{2}$ fluid ounce,
Boiling water	-	-	-	10 fluid ounces.

Mix the linseed meal gradually with the water, and then add the oil, with constant stirring" (Tuson).

Charcoal Poultice.

" Wood charcoal, in powder	-	-	-	$\frac{1}{2}$ ounce,
Linseed meal	-	-	-	3 $\frac{1}{2}$ ounces,
Boiling water	-	-	-	10 fluid ounces.

Add the linseed meal to the water, and stir them together so that a soft poultice may be formed. Mix with this half the charcoal, and sprinkle the remainder on the surface of the poultice" (Tuson).

*Refrigerants.**Sal ammoniac (chloride of ammonia).*

Sal ammoniac	-	-	-	-	1 part,
Nitre	-	-	-	-	1 „
Water	-	-	-	-	18 parts.

Or—

Sal ammoniac	-	-	-	-	2 oz.,
Vinegar	-	-	-	-	1 pint,
Methylated spirits of wine	-	-	-	-	1 „
Water	-	-	-	-	2 quarts.
(Stonehenge.)					

*Sedatives and Narcotics.**Aconite.*—See page 173.*Belladonna.*—See page 266.*Anodyne Application.*

Camphor	-	-	-	-	1 part,
Extract of belladonna	-	-	-	-	2 parts.

Dissolve the camphor in a little spirit, and make the application of sufficient consistency to adhere to the skin by the addition of a little gum.

Camphor.—See pages 180, 181, 216, and 220.*Opium.*—Usual dose 1 drachm

In cases of great pain, such as in enteritis, very large doses can be borne with impunity.

Tincture of Opium.

Opium in powder	-	-	-	-	1 part,
Water	-	-	-	-	4 parts.

Digest for 24 hours over a slow fire, while keeping the temperature at from 150° to 200° F. Then add spirits of wine, till 8 parts of the fluid contain 1 part of opium. An ounce of this tincture will be equal in strength to a drachm of the powder. 1½ oz. of ordinary laudanum is about equal in effect to 1 oz. of this tincture.

In diseases of the brain and spinal cord, opium should not be employed, as it is a stimulant to them. In these cases belladonna is a proper sedative.

Prussic Acid.—See page 37.

Tobacco.—See page 269.

Stimulants.

Arnica.—Dose of the tincture, 1 to 2 oz. See page 177. Externally, a wineglassful to a quart of warm water is most useful as an application to recent sprains.

Carbonate of Ammonia.—Dose, 1 to 2 drachms. See page 174. If given in a drench it should be largely diluted.

Spirits.—Brandy, &c., may be given in ¼-pint doses.

Sweet Spirits of Nitre.—Dose, 1 to 2 ounces.

Tonics.

Ale and Stout.—Are excellent tonics. A quart may be given three times a day.

Chiretta.—A valuable vegetable tonic, which is very common in India. If pounded and mixed in the food horses will soon learn to eat it readily. Chiretta and nux vomica appear to be the only bitters that horses will consume voluntarily. Dose, 1 oz. twice a day.

Gentian.—Is usually used in powder. Dose, 2 to 4 drachms. May be given in ale or stout, with an equal quantity of powdered ginger. Is an excellent bitter.

Nux Vomica.—Is a most valuable tonic and bitter, principally on account of the presence of its active principle, strychnine, and also from its stomachic properties. See pages 266 and 269.

Dose, 1 to 2 drachms twice a day.

Quinine.—The expense of this drug will generally preclude its use in veterinary practice; however, in the case of a valuable animal, recovering from a debilitating illness, it might be tried, with advantage, in drachm doses twice a day; it might here be combined with a drachm of the tincture of steel. Quinine by itself will require the addition of a little sulphuric acid to make it dissolve in water.

Sulphate of Iron.—Should be kept in well-stoppered bottles, for if exposed to the air it will gradually become decomposed. It is a most valuable tonic; its action appears to be specially directed to improving the quality of the blood. Its use should be discontinued as soon as it causes the fæces to assume a dark colour, for this will indicate that an excess is given, which the system cannot assimilate, and that a laxative is necessary. Dose, 20 grains to 1 drachm twice a day. Half a drachm twice a day mixed in the food will usually be quite enough.

Strychnine.—See *Nux Vomica*.

Miscellaneous.

Bichromate of Potash.—See page 244.

The following preparations are recommended by French veterinary surgeons for chronic enlargements about the joints:—

Bichromate of potash	-	-	-	1 part,
Lard	-	-	-	8 parts,
and—			•	
Bichromate of potash	-	-	-	2 „
Iodide of potassium	-	-	-	1 part,
Mercurial ointment	-	-	-	32 parts.

Mix without applying heat.

Ipecacuanha.—See pages 254—256.

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A P P E N D I X.

HINDUSTANEE VETERINARY VOCABULARY.

The following vocabulary has been taken, in substance, from my "Guide to Training and Horse Management in India." I have added a few words from the Glossary compiled by Hem Chunder Kerr, appended to a Report on Indian Cattle Plagues, 1871, and also from the "Manual of the more Deadly Forms of Cattle Disease in India," by J. H. B. H.

In order to render the pronunciation easy to those unacquainted with Hindustanee, I have written the vowels as they are pronounced in the following words :—

<i>a</i> as in "star."	<i>o</i> as in "tore."	<i>oo</i> as in "poor."
<i>é</i> ,, "écarte."	<i>u</i> ,, "fun."	<i>ow</i> ,, "town."
<i>i</i> ,, "kin."	<i>û</i> ,, "pull."	<i>y</i> ,, "by."

n should be pronounced like the French nasal *n*, as in "mon."

The Hindee letters *d*, *t*, and *r*, are hard as in English, and are respectively aspirated when they are followed by the letter *h*.

kh and *gh* represent the two Arabic gutturals.

PARTS, &c., OF THE HORSE.

Back, *Peeth*.
 Backbone, *Reerh*.
 Back tendon, *Ghūr-nuss*.
 Bars of the foot, *Dohreepūtlee*.
 Belly, *Pét*.
 Bladder, *Phukna*.
 Blood, *Khoon*.
 Bone, *Huddee*.
 Brain, *Mughz*.
 Cannon-bone, *Nutlee*.
 Cartilage, *Kurree huddee*.
 Cheek, *Gal*.
 Chest, *Chhatee*, or *Seena*.
 Corners of the mouth, *Bachh*.
 Coronet, *Mughzee*, or *Bhown*.
 Dock, *Sagiree*.
 Ear, *Kan*.
 Eye, *Ankh*.
 Eyelash, *Buronee*.
 Eyelid, *Puluk*.
 Fetlock, *Mūttha*.
 Fibre (of Muscle, &c.), *Résha*.
 Foot, *Pyr*.
 Fore-arm, *Bazoo*, or *dund*.
 Fore-leg, *Hath*.
 Fore-head, *Mattha*.
 Fore-lock, *Chotee*.
 Foam (from the mouth), *Kuf*.
 Frog, *Pūtlee*.
 Gullet, *Nurkhura*.
 Hair of the mane or tail, *Bal*.
 " body, *Roan*, or *Rom*.
 Haw, *Butana*.
 Head, *Sir*.
 Heart, *Dil*.
 Heel of the hoof, *Khoontee*.
 Hind leg, *Paon*.
 " quarters, *Pūtha*.
 Hip, *Koola*.
 Hook, *Koona*.

Hoof, *Stm*.
 Intestines, *Unturee*.
 Jaw, *Jubra*.
 Joint, *Jor*, *ganth*, or *giri*.
 Kidney, *Gurda*.
 Knee, *Gūtina*, or *zanoo*.
 Lip, *Honth*.
 Liver, *Kulléja*.
 Loins, *Kumr*.
 Lungs, *Phéphra*.
 Mane, *Yal*.
 Mouth, *Moonh*.
 Muzzle, *Thoothun*.
 Neck, *Gurdun*.
 Nose, *Nak*.
 Nostrils, *Nuthna*.
 Palate, *Taloo*.
 Pulse, *Nubz*.
 Pancreas, *Libba*.
 Pastern, *Gamchee*.
 Pores of the skin, *Musam*.
 Papil of the eye, *Ankh kee*
 pūtlee.
 Ribs, *Puslee*.
 Saliva, *Bal*.
 Sheath, *Fota*.
 Shoulders, *Phur*.
 Sinew, *Nuss*.
 Skin, *Ohumra*.
 Sole of the foot, *Dilla*.
 Stifle, *Kulaba*.
 Tail, *Dum*.
 Tendon, *Py*, *nuss*, or *puttha*.
 Temple, *Kun-puttee*.
 Tooth, *Dant*.
 " (temporary), *Doodh ka*
 dant.
 Thigh, *Ran*.
 Throat, *Gulla*.
 Tongue, *Jeebh*.

Tushes, *Nésh*, or *khoontee*.
 Vein, *Rug*.
 Wall of the hoof, *Shakh*.
 Windpipe, *Hulk*.

Withers, *Mudow*.
 Wolf's tooth, *Chor dant*.
 Yard, *Nésa*.

DISEASES, &c.

Anasarca, *Tubuk*.
 Asthma, *Dumma*.
 Blind, *Andha*.
 „ of one eye, *Kana*.
 Barbs, or paps, *Unchhur*.
 Blister, *Chhala*.
 Boil, *Phora*.
 Bots (eggs), *Leek*.
 „ (larvæ), *Bur*.
 Bronchitis, *Kuf*.
 Brittle feet, *Súm Khara*.
 Bruise, *Chat*.
 Brush, to, *Néwur lugna*.
 Canker of the foot, *Kufgeera*.
 Capped elbow, *Kheesa*.
 „ hock, *Kúhneea*.
 „ knee, *Zanooa*.
 Cataract, *Jala*.
 Catarrh, *Kunar*, or *Surdhee*.
 Chest founder (?), *Chhatee-bund*.
 Cold, *Zukam*.
 Colic, *Kúrkúree*.
 „ flatulent, *Jowgeera*.
 „ spasmodic, *Abgeera*.
 Consumption, *Khúshkbbál*.
 Corn, *Chhala*.
 Cough, *Khansee*.
 Cracked heels, *Gamchee men chheewur*.
 Curb, *Bujr Huddeé*.
 Cyst, *Jowa*.
 Diarrhoea, *Dust*.
 Dropped hip, *Kum Koola*.
 Dull, to be, *Sást hona*.
 Dysentery, *Péchish*, or *Khoonce dust*.
 Elephantiasis, *Feel pa*.
 Enteritis, *Boghma*.

Epilepsy, *Mirgee*.
 Farcy, *Zahirbad*.
 Fever, *Tup*, or *búkhar*.
 Fill, to fill (as a leg), *Py ajana*.
 Flat feet, *Chápatee súm*.
 Foot-and-mouth disease (cattle)
Khúrpuka, or *Kúrha*.
 Glanders, *Khumak*.
 Hidebound, *Ohirm Khúshk*.
 Hoven (cattle), *Badee*.
 Indigestion, *Budhuzmee*.
 Inflammation, *Julun*, or *Sozish*.
 Jaundice, *Yurkanor Kunwulbad*.
 Lame, *Lungra*.
 „ chronically, *Kulna lung*.
 Lampas, *Talooa*.
 Loins; gone in the, *Kumree*.
 Loodiana fever, *Gutheea*, or
bhogona.
 Madness, *Deewangee*.
 Maggots, *Keeré*.
 Mange, *Khújlee*.
 Megrimis, *Mirgee*.
 Melanosis, *Bamunee*.
 Moonblindness, *Ruttowndhee*, or
shub-koree.
 Navicular disease, *Súrumbad* (P)
 Ophthalmia, *Ankh uthna*.
 Pleuro-pneumonia (cattle), *Pheo-
 pee*.
 Pneumonia, *Zeek nufus*.
 Pumiced feet, *Khúr stuma*.
 Pus (matter), *Peeb*.
 Quarter ill, anthrax fever (cat-
 tle), *Gutheea*, or *golee*.
 Retention of urine, *Péshab bund*.
 Rinderpest (cattle), *Mata*, or
chéchuk.

Ringbone on the fore foot, *Chukuwul*.
 Ringbone on the hind foot, *Pústuk*.
 Ringworm, *Dail*.
 Roar, to, *Shérdumee kurna*.
 Rot (in sheep), *Kirm jigur*.
 Sanderack, *Shikak süm*.
 Sore back, to have a, *Peeth lugna*.
 „ mouth, *Buchka*.
 „ throat, *Gulsooa*.
 Spavin, bog, *Motra*.
 „ bone, *Hudda*.
 Splint, *Bél Huddee*.
 Sprain, *Moch*.
 Strangles, *Khúbuk*.
 Stringhalt, *Thunukbad*.

Surfeit, *Gurmeé dané*.
 Swelling, *Wurum* or *Soojun*.
 Tetanus, *Chandnee marna*, or *pista dahun*.
 Thoroughpin, *Bhubhootura*.
 Thrush, *Russ*.
 Tympanitis, *Badee*.
 Wart, *Mussa*.
 Weave, to, *Jhoomna*.
 Weed, *Bél (?)*.
 Wen, or indolent tumour, *Russowlee*.
 Windgall, *Byza*.
 Worm in the eye, *Moonja*.
 „ round, *Kénchooa*.
 „ thread, *Chúunchúna*.
 Wound, *Zukhm*.

MEDICINES, &c.

Acid, *Térah*.
 Aloes, *Misubur*, or *éhwa*.
 Alum, *Phitkuree*.
 Antimony (black), *Sírma*.
 Arsenic, *Sunkheea*.
 Assafetida, *Heeng*.
 Ball (physic), *Duwa kee golce*.
 Bandage, *Puttee*.
 Bluestone, *Neela tootcea*.
 Borax, *Sohaga*.
 Bran, *Chokur*.
 Carrots, *Gajur*.
 Camphor, *Kafoor*.
 Castor Oil, *Kéndes ka tél*.
 Catechu, *Kuth*.
 Caustic, *Tootcea*.
 Chalk, *Khuree muttee*.
 Croton, *Jumalgota*.
 Iron, sulphate of, *Hurree Kussees*.
 Kerosine oil, *Muttee ka tél*.
 Lard, *Soor kee churbee*.
 Leech, *Jonk*.
 Lime, *Choona*.
 Linseed oil, *Ulee ka tél*.

Mustard, *Rai*.
 Nitre, *Shora*.
 Oil, *Tél*.
 Ointment, *Murhum*.
 Opium, *Afeem*.
 Poppy heads, *Posta*.
 Poultice, *Lubdee*.
 Powder (medicine), *Súfoof*.
 „ (wrapped up in paper), *Púreen*.
 Resin, *Ital*.
 Sal ammoniac, *Nowsadur*.
 Salt, *Nimmuk*.
 Salts (Epsom), *Julabee nimuk*.
 Soap-nut, *Reeta*.
 Sugar of lead, *Suféda*.
 Sulphur, *Gunduk*.
 Sweet oil, *Mectu tél*.
 Tow, *Sun*.
 Turpentine, *Gunda biroze ka tél*.
 Venice turpentine, *Gunda biroza*.
 Verdigris, *Jungal*.
 Vinegar, *Sirka*.
 Wax, *Moom*.

